

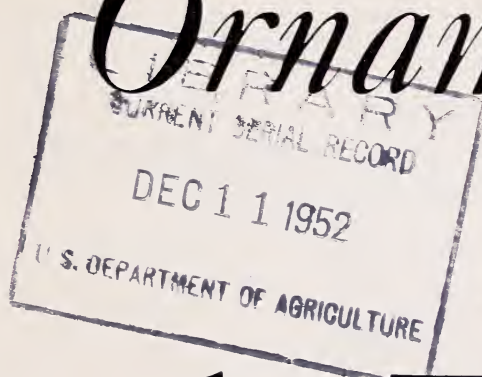
Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

1
265
Reser

1 3
EX65
Reserve

Some Large-Leaved Ornamental Plants for the Tropics



Circular No. 35
Federal Experiment Station in Puerto Rico
U. S. DEPARTMENT OF AGRICULTURE

FEDERAL EXPERIMENT STATION IN PUERTO RICO

MAYAGUEZ, PUERTO RICO

Administered by the Office of Experiment Stations
Agricultural Research Administration
United States Department of Agriculture

R. W. TRULLINGER, *Chief, Office of Experiment Stations*

STATION STAFF

KENNETH A. BARTLETT, *Director.*

ARNAUD J. LOUSTALOT, *Assistant Director and Plant Physiologist.*

HARRY E. WARMKE, *Plant Geneticist.*

LEON A. SNYDER, *Plant Geneticist.*

HAROLD F. WINTERS, *Horticulturist.*

WILLIAM C. KENNARD, *Horticulturist.*

MURRELL P. MORRIS, *Chemist.*

THOMAS J. MUZIK, *Plant Physiologist.*

THOMAS THEIS, *Plant Pathologist.*

CALEB PAGÁN CARLO, *Chemist.*

HÉCTOR J. CRUZADO, *Agronomist.*

RUBÉN H. FREYRE, *Agronomist.*

ELIDA VIVAS, *Scientific Aid.*

CARMELO ALEMAR, *Administrative Assistant.*

NARCISO ALMEYDA, *Collaborating Agronomist.*¹

EUGENIO CABANILLAS, *Collaborating Agronomist.*¹

FÉLIX A. JIMÉNEZ TORRES, *Collaborating Agronomist.*¹

FRANK LLAVAT CRISTY, *Collaborating Agronomist.*¹

FRANCISCO RODRÍGUEZ COLÓN, *Collaborating Agronomist.*¹

ASTOR GONZÁLEZ, *Collaborating Librarian.*¹

¹In cooperation with the Government of Puerto Rico.

COVER ILLUSTRATION.—*Pandanus pacificus* produces a large mass of dark green foliage which is useful in screening undesirable views.

**FEDERAL EXPERIMENT STATION IN
PUERTO RICO**

**OF THE
UNITED STATES DEPARTMENT OF AGRICULTURE**

MAYAGUEZ, PUERTO RICO

CIRCULAR NO. 35

Washington 25, D. C.

October 1952

**SOME LARGE-LEAVED ORNAMENTAL PLANTS
FOR THE TROPICS**

By HAROLD F. WINTERS, *Horticulturist*

CONTENTS

	Page		Page
Introduction.....	1	Description of the plants.....	8
Utilization of large-leaved plants in gardening.....	2	Index to plants by scientific and common English and Spanish names.....	87
Ornamental value.....	2	Literature cited.....	91
Obtaining and propagating the plants.....	4		
Naming the plants.....	7		

INTRODUCTION

In 1949 the Federal Experiment Station in Puerto Rico started a series of circulars to describe the ornamental plants that had been introduced and tested by the station since it was established approximately 50 years ago. The first of these publications, "Some Ornamental Vines for the Tropics," appeared as Circular No. 31 (11)¹. Two years later Circular No. 34 (12), "Some Ornamental Shrubs for the Tropics," was issued. As suggested by the titles, these publications included detailed descriptions and illustrations of the many vines and shrubs that have been tested as part of the station's plant-introduction program.

The present circular deals with the ornamental herbaceous perennial plants that are characteristic of the Tropics. These are the plants which, more than any others, give the Tropics their "tropical" look, and include the large-leaved plants grown in temperate climate botanical gardens as "tropicals." The banana plant, *Musa* sp., is a typical example. The plants discussed have

¹ Numbers in parenthesis refer to Literature Cited, p. 91.

been collected from the African, Asian, Indonesian, and American Tropics as well as from the islands of the South Pacific. It is hoped that this publication will encourage readers in Puerto Rico and other tropical areas not only to utilize the plants described here but to bring into cultivation local plants of ornamental value. For the most part, the plants described are grown for their ornamental foliage but many bear attractive flowers as well.

No attempt has been made to describe the large group of epiphytic orchids and bromeliads found in the Tropics. Also for the most part the large group of cacti and succulent desert plants has been excluded although found in tropical regions. Additional information about these and other plants may be secured by reading Bailey (2), Neal (20), and other authors (3, 4, 7, 8, 9, 16, 18, 20, 21, 22, 24, 28, 30, 33, 34).

UTILIZATION OF LARGE-LEAVED PLANTS IN GARDENING

In the Tropics gardening is a year-round activity. In countries with Spanish background, patios and walled gardens, which practically make the garden a part of the house, are traditional. Such continuous use of the garden in everyday life makes it highly desirable to select carefully the plants to be included.

The large-leaved ornamental perennial plants are especially suitable for this purpose. Many of them make excellent pot plants for the house or patio. Many are suitable for low borders along walks, drives, or in front of taller plants. Still others may be combined in mass plantings with shrubs or to take the place of shrubs. Some tall growers are well suited for screening undesirable views, for backgrounds, or for boundary plants. In table 1 the plants are classified according to average height attained under good garden conditions in Puerto Rico. In the individual descriptions of these plants given in the following sections the recommended use for each plant is discussed.

ORNAMENTAL VALUE

In order to select the proper foliage plant for a given location or use one should know its distinctive characters. The plants are classified according to these characters in the following listing:

Plants with ornamental green foliage

<i>Agave sisalana</i>	<i>C. edulis</i>
<i>Aglaonema simplex</i>	<i>Canna</i> spp.
<i>Alocasia macrorrhiza</i>	<i>Colocasia esculentum</i>
<i>Alpinia antillarum</i>	<i>Cordyline terminalis</i>
<i>A. purpurata</i>	<i>Costus cylindricus</i>
<i>A. speciosa</i>	<i>C. speciosus</i>
<i>Amomum</i> sp.	<i>Cyperus alternifolius</i>
<i>Anthurium acaule</i>	<i>Dieffenbachia seguine</i>
<i>A. andreanum</i>	<i>Furcraea tuberosa</i>
<i>A. longilaminatum</i>	<i>Hedychium coronarium</i>
<i>A. scandens</i>	<i>Hedychium hybrid</i> (<i>H. flavum</i> ×
<i>Aspidistra lurida</i>	<i>H. gardnerianum</i>)
<i>Bromelia pinguin</i>	<i>Hedychium</i> sp.
<i>Canna coccinea</i>	<i>Heliconia bihai</i>
	<i>H. latispatha</i>

Molineria hortensis
Musa nana
M. paradisiaca
M. paradisiaca ssp. *sapientum*
Musa sp.
Pandanus pacificus
P. utilis
Peperomia obtusifolia
Phaeomeria speciosa

Philodendron sp.
Ravenala madagascariensis
Strelitzia nicolai
S. reginae
Tacca chantrieri
Xanthosoma caracu
Yucca aloifolia
Y. elephantipes
Y. gloriosa
Zantedeschia aethiopica

Plants having foliage variegated with white, yellow, or shades of green

Agave americana (variegated)
A. angustifolia var. *marginata*
Aglaonema commutatum
A. costatum
Alocasia macrorrhiza (variegated)
Alpinia sanderæ
Anthurium magnificum
Aspidistra lurida var. *variegata*
Caladium bicolor and *Caladium*
hybrids
Costus malorteanus
Dieffenbachia picta
D. picta var. *bausei*
D. picta var. *Rudolph Roehrs*
D. squigine

Dracena fragrans var. *lindenii*
D. fragrans var. *massangeana*
D. sanderiana
Dracontium polyphyllum
Furcraea selloa var. *marginata*
Maranta arundinacea var. *variegata*
Pandanus baptisti
P. veitchii
Peperomia obtusifolia (variegated)
Sansevieria cylindrica
Sansevieria sp.
S. subspicata
S. thyrsiflora
S. trifasciata var. *laurentii*

Plants having red or purple foliage or green foliage marked with these colors

Alocasia indica var. *metallica*
Caladium bicolor and *Caladium*
hybrids
Canna edulis
Canna spp.
Colocasia sp.
Cordyline terminalis

Heliconia edwardus rex
Musa paradisiaca ssp. *sapientum*
M. sumatrana
Rhoeo discolor
Tacca chantrieri
Xanthosoma jacquini

Plants having combinations of green, white or yellow, and red or purple markings in the foliage

Caladium bicolor and *Caladium*
hybrids
Calathea lietzei
C. ornata
C. vandenheckei
C. zebrina

Cordyline terminalis var. *tricolor*
Ctenanthe oppenheimiana
Kaempferia rotunda
Maranta leuconeura var. *kerchoveana*
Peperomia sandersii var. *argyreia*

Plants with showy flowers or flower-bearing structures

Alpinia antillarum
A. purpurata
A. speciosa
Amomum sp.
Anthurium andraeanum
A. scherzerianum
Canna coccinea
C. edulis
Canna spp.
Costus cylindricus
C. malorteanus
C. speciosus
Dracontium polyphyllum
Hedychium coronarium

Hedychium hybrid (*H. flavum* ×
H. gardnerianum)
Hedychium sp.
Heliconia bihai
H. latispatha
Kaempferia rotunda
Musa sp.
Phaeomeria speciosa
Strelitzia nicolai
S. reginae
Yucca aloifolia
Y. elephantipes
Y. gloriosa
Zantedeschia aethiopica

Plants with distinctive shape

<i>Agave americana</i>	<i>P. utilis</i>
<i>A. angustifolia</i> var. <i>marginata</i>	<i>P. veitchii</i>
<i>A. sisalana</i>	<i>Ravenala madagascariensis</i>
<i>Bromelia pinguin</i>	<i>Sansevieria cylindrica</i>
<i>Cyperus alternifolius</i>	<i>Sansevieria</i> sp.
<i>Dracontium polyphyllum</i>	<i>S. subspicata</i>
<i>Furcraea selloa</i> var. <i>marginata</i>	<i>S. thyrsiflora</i>
<i>F. tuberosa</i>	<i>S. trifasciata</i> var. <i>laurentii</i>
<i>Pandanus baptisti</i>	<i>Strelitzia nicolai</i>
<i>P. pacificus</i>	<i>Yucca elephantipes</i>

OBTAINING AND PROPAGATING THE PLANTS

Usually the most rapid and satisfactory way to secure plants of the type described in this circular is by purchase from a reputable nurseryman. Often propagation material can be secured from neighboring gardens or public institutions. If such material is available many of the plants may be increased by the home gardener either by growing plants from seed or by vegetative propagation. The vegetative method is the only one by which many of the variegated varieties may be propagated through the division of old plants, rhizomes, or tubers. However, some plants can be propagated by cuttings; and others may be propagated by bulbils or apomictic plantlets that develop in the inflorescence. Plant propagation is more fully discussed in books and circulars on the subject (2, 10, 13, 14, 26, 31, 32).

Seed.—Many of the plants described in this publication produce seed. Where seed is available this is the least expensive method of propagation, but it is not always the easiest way to secure a stock of some particular plant. It is often a job for the specialist to grow plants such as Anthuriums from seed. Nevertheless, every gardener should have some facility for growing plants. It may be a box of soil protected from beating rains by an overhanging roof, or a permanent garden structure such as a plant shed, lath house, or greenhouse. In figure 1 a good example is shown of both a greenhouse and a shade house, and others are described and illustrated in the publication "Sunset Ideas for Building Plant Shelters and Garden Work Centers," (1), and by Post (27).

Some measures must be adopted to protect the seedbed from rain; otherwise the losses from the washing out of seed and plants or from damping-off disease will be heavy. Although written for vegetable gardeners, the publication by Childers et al. (5, pp. 31-46) discusses seeding practices that apply equally well to the growing of ornamental plants. A friable mixture that holds moisture is usually best for seedbeds. This can be secured by mixing leafmold and sand with the soil. When the seedlings are large enough they should be transplanted to individual containers or outdoor nurseries and allowed to grow until they are ready for planting in a permanent location in the garden.

Ornamental plants often need considerable shade when young. Shade may be obtained in a combination garden house that is also used to shelter orchids and tender foliage plants. In the Tropics,

TABLE 1.—Large-leaved plants grouped according to size

Less than 3 feet	3 to 6 feet	6 to 12 feet	12 feet or higher
<i>Agave angustifolia</i> var. <i>marginata</i> <i>Aglaonema commutatum</i> <i>A. costatum</i> <i>A. simplex</i> <i>Anthurium acacule</i> <i>A. andraeanum</i> <i>A. scandens</i> <i>Aspidistra lurida</i> <i>Bromelia pinguin</i> <i>Caladium bicolor</i> <i>Calathea lietzei</i> <i>C. ornata</i> <i>C. vandenheckei</i> <i>C. zebrina</i> <i>Canna</i> sp. <i>Colocasia</i> sp. <i>Costus malortianus</i> <i>Ctenanthe oppenheimiana</i> <i>Dieffenbachia picta</i> <i>D. picta</i> var. <i>bausei</i> <i>D. picta</i> var. <i>Rudolph</i> <i>Kaempferia rotunda</i> <i>Maranta arundinacea</i> var. <i>variegata</i> <i>M. leuconeura</i> var. <i>kerchoveana</i> <i>Peperomia obtusifolia</i> <i>P. sandersii</i> var. <i>argyreia</i> <i>Rhoeo discolor</i> <i>Sansevieria cylindrica</i> <i>Sansevieria</i> sp. <i>S. subspicata</i> <i>S. thyrsoflora</i> <i>S. trifasciata</i> var. <i>laurentii</i> <i>Strelitzia reginae</i> <i>Tacca chantrieri</i> <i>Zantedeschia aethiopica</i>	<i>Agave americana</i> <i>A. sisalana</i> <i>Alocasia indica</i> var. <i>metallica</i> <i>A. macrorhiza</i> <i>A. macrorhiza</i> (variegated) <i>Alpinia antillarum</i> <i>A. sanderæ</i> <i>Anomum</i> sp. <i>Anthurium longiluminatum</i> <i>A. magnificum</i> <i>Canna coccinea</i> <i>Canna</i> sp. <i>Colocasia esculentum</i> <i>Cyperus alternifolius</i> <i>Dieffenbachia seguinæ</i> <i>Dracaena sanderiana</i> <i>Dracontium polyphyllum</i> <i>Furcraea sellosa</i> var. <i>marginata</i> <i>F. tuberosa</i> <i>Hedychium coronarium</i> <i>Hedychium hybrid</i> <i>Heliconia edwardus rex</i> <i>Molineria hortensis</i> <i>Musa</i> sp. <i>Philodendron</i> sp. <i>Xanthosoma caracæ</i>	<i>Alpinia purpurata</i> <i>A. speciosa</i> <i>Canna edulis</i> <i>Canna</i> spp. <i>Cordyline terminalis</i> <i>C. terminalis</i> var. <i>tricolor</i> <i>Costus cylindricus</i> <i>C. speciosus</i> <i>Hedychium</i> sp. <i>Heliconia latispatha</i> <i>Musa nana</i> <i>M. sumatrana</i> <i>Xanthosoma jacquini</i> <i>Yucca aloifolia</i> <i>Y. gloriosa</i>	<i>Dracaena fragrans</i> <i>Heliconia bihai</i> <i>Musa paradisica</i> <i>M. paradisica</i> ssp. <i>sapientum</i> <i>Pandanus baptisti</i> <i>P. pacificus</i> <i>P. utilis</i> <i>P. vetchii</i> <i>Phaeomeria speciosa</i> <i>Ravenala madagascariensis</i> <i>Strelitzia nicotai</i> <i>Yucca elephantipes</i>

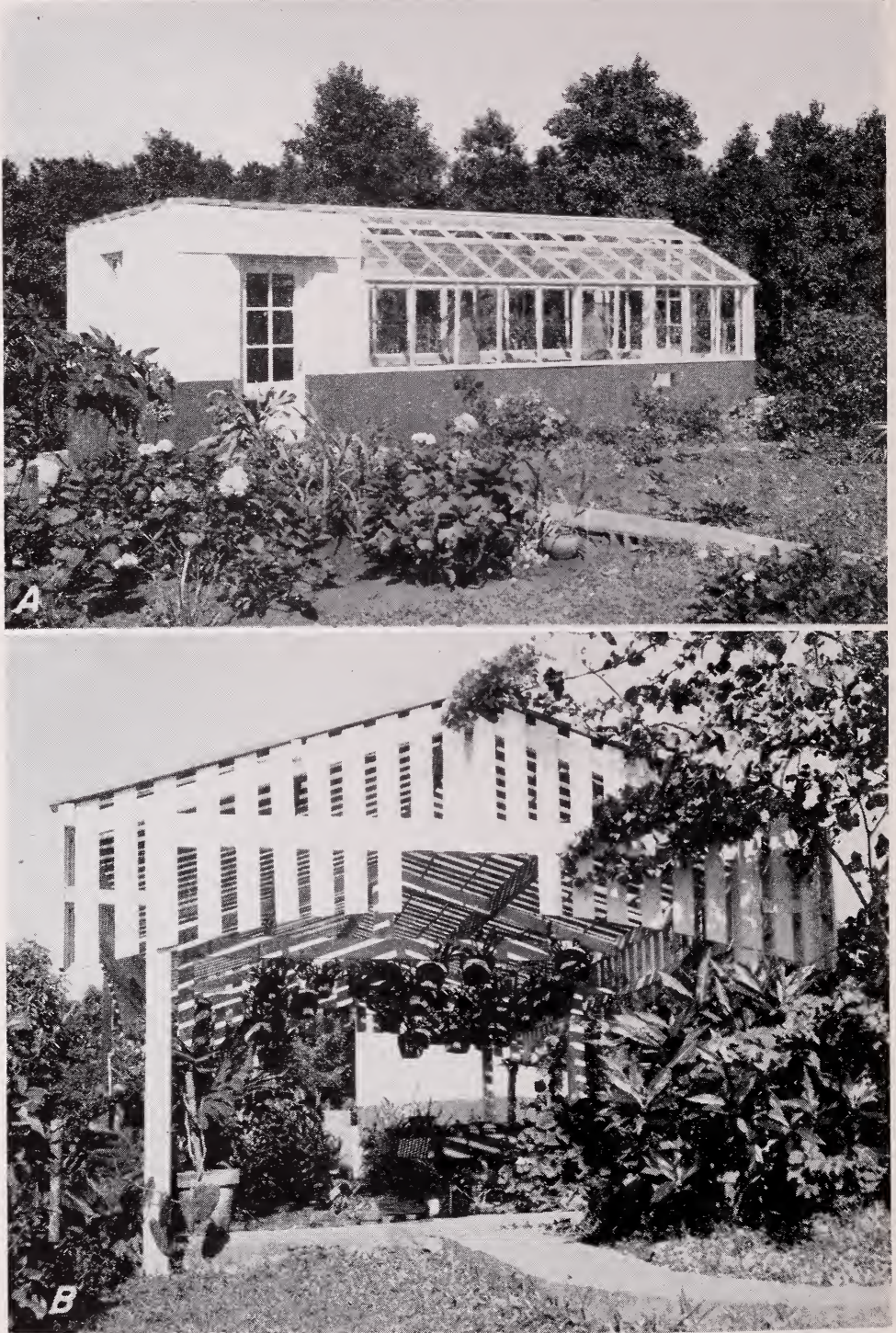


Figure 1.—Every tropical garden should have some arrangement to protect young seedlings and tender plants from the intense sun, drying winds, and beating rains of the Tropics. The small greenhouse, *A*, is better adapted to large estates or for the more ardent gardener, such as the orchid enthusiast; whereas some sort of shade and workhouse, *B*, could be fitted into the average garden.

bamboo, where available, can be utilized to build attractive garden structures. Where rainfall is high split bamboo culms with the septa removed may be used hollow side up as the roof bars to give shade and at the same time to carry off part of the water from rainfall.

Division.—Some of the plants described in this circular can be propagated only by division of established clumps, rhizomes, or tubers. This is usually done just as the plants start into active growth at the beginning of the rainy season. Sometimes part of the old plant can be split off with a spade and planted directly in the new location. To secure the greatest number of plants it is best to dig up the old clump and cut it with a sharp knife into as many parts as there are new growing points. These can be planted directly in the prepared locations or, before they are transplanted, they can be given special care in a nursery row until they are well started.

Cuttings.—Many of the large-leaved plants can be propagated by stem cuttings. Although it may be sufficient in the case of some species to stick a piece of the stem in the ground or a pot of soil, best results will usually be obtained by first placing the pieces in special propagation beds. These beds may be only a box or bed of sand located so that shade and moisture can be controlled. Peat moss or pulverized coconut husks may be mixed with the sand to increase its water-holding capacity.

Several plants of the genera *Dracaena*, *Cordyline*, *Aglaonema*, and *Dieffenbachia* are frequently propagated by placing 3-inch sections of the stems horizontally on the propagation beds until new shoots develop at the nodes. These shoots when removed and rooted in sand produce strong plants of a desirable shape.

Apomyxis.—A number of tropical plants reproduce by a vegetative process known as apomyxis. Under this method of reproduction small plants develop from the inflorescence but are not the result of fertilized ovules. Apomyxis is particularly common in the members of the Amaryllidaceae and the Zingiberaceae families, described in this circular. Usually the plantlets can be left on the parent plant until well developed when they may be planted directly in a permanent location or placed in a nursery row until they are larger and stronger.

NAMING THE PLANTS

In the individual plant descriptions the plants are listed according to the accepted scientific name. This is usually the name given in *Standardized Plant Names* (15). Where synonyms are in common usage they are listed following the approved names. The common English names are from several sources (2, 3, 4, 15, 20). Spanish common names are for the most part those used in Puerto Rico as listed by Otero, Toro, and Otero (25). All of these names are listed in the index, page 87, in alphabetical order to facilitate location of a given plant. The family name is listed last in Roman type. The fact that the names are first listed in latinized form need not prevent the layman from enjoying or utilizing this pub-

lication. It is simply a schematic classification worked out through the years that is highly accurate and universally accepted in all languages.

Practically all of the plants described in this publication belong to the large plant group known as monocotyledonous plants in which the embryonic plant has only one seed leaf instead of two. It will be noticed that most of the plants described belong to only a few families such as the Araceae or Arum family, Musaceae or banana family, and the Zingiberaceae or ginger family. This large classification group is further broken down into the genus which is the first name listed for each plant. Plants of the same genus are closely related but are distinguished from each other as species, the second name listed. A further breakdown into subspecies or varieties is sometimes necessary. The abbreviated name or initial following the genus and species names is the author who described the species.

An effort has been made to keep the plant descriptions brief but at the same time to give sufficient information from which the plants can be identified, and to avoid technical terms that might not be understood by the average reader. In order to give a concise description, however, it was necessary to use certain accepted names for parts of plants and flowers. For definitions of these the reader is referred to Webster's New International Dictionary (23) which is an excellent source of botanical information.

In some instances the word "flower" is used in the plant descriptions where "inflorescence" would be technically correct. This is particularly true in the Araceae and Zingiberaceae families, in which flowers are seldom borne singly but a number are united to form the inflorescence.

Often the true flowers are minute and inconspicuous. In the Araceae the true flowers are borne along a simple stalk called the spadix. This structure is subtended by a bract-like structure called the spathe. The spathe may be either green or colored and flat as in the genus *Anthurium* (fig. 14) or curled about the spadix as in the genus *Zantedeschia*, which includes the common calla lily. A "bract" is a structure at the base of leaves or flowers that resembles leaves or is colored like flowers. Colored bracts comprise the showy parts of the inflorescence in many of the species described in this publication.

DESCRIPTION OF THE PLANTS

Agave americana L.
Centuryplant (fig. 2)
"Maguey," "Henequén," "Pita"
Amaryllidaceae

Although several species of *Agave* are native to Puerto Rico, the centuryplant, probably native to Mexico, is the one most commonly cultivated. The almost stemless plants bear 30 to 60 grey-green lanceolate leaves 3 to 6 feet long and 6 to 9 inches across which become recurved at the tip with age. The name "centuryplant" was given to it because the plants were supposed to flower only once in 100 years and then die. Actually a plant may mature

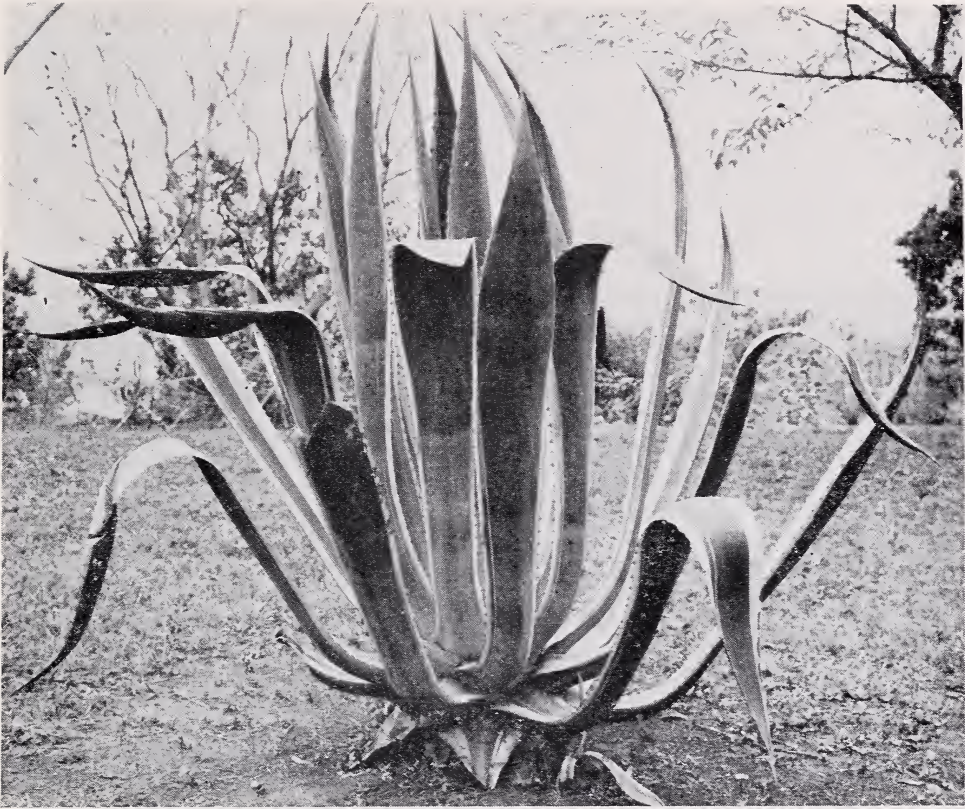


Figure 2.—The variegated centuryplant, *Agave americana*, is grown for the ornamental effect of its large leaves. It should be used as a specimen plant and given ample room.

and flower in 10 or 15 years when conditions of soil and moisture are favorable.

The stout flower stems which develop from the center of the rosette of leaves may reach 25 or 30 feet in height. The 3-inch long yellow flowers are borne in clusters on side branches which arise near the apex of the inflorescence. After flowering, plants usually become unsightly and should be removed. The variegated variety is commonly grown for the landscape effect of its large rosette of stiff spiny leaves.

The centuryplant is adapted to full sunlight and grows well under arid conditions. Because of the ornate, striking form, the plants are useful chiefly as specimen plants in large gardens. Ample room should be allowed at planting time as the plants increase in size for many years. The plants are propagated from suckers or occasionally from seed.

Agave angustifolia var. *marginata* Trel.

Agave (fig. 3, A)

Amaryllidaceae

This short-trunked or trunkless ornamental species is frequently seen in tropical gardens. The compact plants are extremely neat in growth retaining even the basal leaves in good condition for a

number of years. The rather flat leaves measure up to 2 feet in length and 3 inches in width. They are gray green in color and longitudinally striped with white along the margin. Each leaf is tipped with a stout terminal round brownish spine about $\frac{1}{2}$ inch in length. The leaf margin bears reddish-brown spines the tips of which often point at right angle to the bases. Flowers are rarely produced in Puerto Rico.

This agave may be grown as a specimen plant in open locations with full sun or partial shade. It is well adapted to planting on rock outcroppings or low rock walls. The soil should be well



Figure 3.—A, Plants of *Agave angustifolia* var. *marginata* develop attractive rosettes of white-margined leaves. B, *A. sisalana* usually bears elongated leaves with smooth margins as in the two plants on the right. Often plants with spiny margins (left) develop from the smooth type.

drained but otherwise the plants seem to grow well on a wide variety of soil types.

Propagation of this variegated variety is by offsets or suckers, which develop at the base of old plants.

Agave sisalana Perr.
Sisal Hemp, Sisal Agave (fig. 3, B)
"Sisal"

Amaryllidaceae

This Mexican species is the source of sisal fiber and has become widely distributed in the Tropics for fiber production. In the West Indies and many other areas it has gone wild. Large rosettes of leaves 4 to 5 feet long and 4 inches wide are produced on short trunks. The leaves are smooth, gray green with stout 1-inch terminal spines. The leaf margin is smooth in the cultivated variety but forms with prickly margins usually develop where the plants have become naturalized. At maturity the plants develop branched inflorescences about 15 feet tall from the center of the rosette of leaves. Seed capsules are rare but great numbers of bulbils which may be used in propagation develop on the flower spikes. Usually the plants die after flowering.

Plants of sisal serve to ornament the roadsides in countries where they have been introduced. They grow particularly well in semiarid sections but will tolerate considerable rainfall if the site is well drained. Plants of sisal make striking specimens for large grounds where they should be planted in full sun.

Propagation is by the bulbils, which may be started in a nursery row before they are set in their permanent location.

Aglaonema commutatum Schoit (fig. 4, B)
Araceae

Like *Dieffenbachia* (page 45) this plant has erect fleshy stems and variegated leaves. It can be distinguished by its smaller size and by the fact that the flower bracts wither before the fruits ripen. The fleshy stems, which seldom exceed 24 inches in length, usually branch only near the ground level. The sharply pointed leaves, varying in width from 1 to 3 inches and in length from 4 to 7 inches, are dark green marked with irregular spots or bands of silvery green along the lateral veins. Petioles vary from 2 to 4 inches and are sheathed from one-half to almost their full length.

Flower stems are clustered in groups of about four which arise from the same leaf axil. These stems are shorter than the leaves and as the berries ripen become reflexed. Flowers are greenish white, about 2 inches in length, somewhat resembling a miniature calla. The flower bract withers and rots off after flowering, exposing several rounded berries about $\frac{1}{3}$ inch in length which turn red upon ripening.

This species is useful as a potted plant for the house or patio or may be planted directly in foundation or border planting. It grows best in a well drained but moist soil.

Propagation is by cuttings or seed which are produced rather freely and which germinate easily.



Figure 4.—*A*, *Aglaonema costatum* is a dwarf plant with ivory-spotted leaves. *B*, The leaves of *A. commutatum* are marked with irregular bands of silvery green. The small white flowers, *a*, and fruit clusters, *b*, may be seen most of the year.

Aglaonema costatum N. E. Br. (fig. 4, *A*)
Araceae

This dwarf species has fleshy stems 1 to 2 inches in length which branch near the ground level. It produces compact plants which seldom exceed 6 inches in height. The leaves are heart-

shaped or ovate, dark shining green with ivory colored midribs and marked with scattered blotches of ivory. The heavy leaves are 2 to 3 inches in width and 3 to 5 inches in length. The plants grow well in a rich loamy soil with good moisture and are ideally suited for pot culture. They may be grown in the house or patio in shaded or semishaded locations or in a shade house.

The flowers are greenish white, about 1 inch in length, greatly resembling those of the preceding species. Propagation is by division or by short stem cuttings.

Aglaonema simplex Bl.
Chinese Evergreen (fig. 5)
Araceae

This species more than any other is grown for shipment of the canes to the continental United States, where it is grown in water or soil as a florist plant. It is distinguished by the fleshy, green-ringed stems which are as much as 1 inch in diameter in well-



Figure 5.—The Chinese evergreen, *Aglaonema simplex*, is widely cultivated for its attractive green leaves and graceful habit of growth.

developed specimens. Foliage is much like that of *Aglaonema commutatum* except that it has a uniform dark-green color. The ovate oblong to narrow oblong leaves vary from 2 to 4½ inches in width and 7 to 12 inches in length. The leaf blade is marked with 6 to 8 impressed side veins which are prominent on the underside of the leaf; the two halves of the blade are unequal in size. The flower stems which are shorter than the leaf stems are clustered in the leaf axils. Each bears a short spadix which is enclosed by a greenish white tubular spathe. The flowers are followed by ornamental berries.

Aglaonema simplex may be grown in pots for the house or patio or planted directly in the garden. It requires a rich, moist soil but the application of animal manure is thought to cause rotting of the stems. The plants reach their best development in shaded locations. Propagation is by seed or cuttings.

Alocasia indica var. *metallica* Schott

Synonym: *A. plumbea* Hort.

Metallic Indo-Malayan Alocasia

"Malanga Morada" (fig. 6)

Araceae

This strictly ornamental plant is grown for the effect of its metallic purple stems and leaves. It grows from a thick rhizome which becomes stemmy in older plants, sometimes attaining a length of several feet. The leaves are triangular to arrow-shaped, 2 to 4 feet long with the basal lobes acutely pointed. The petioles usually exceed the leaves in length and are attached above the united basal lobes. The flower spathe is divided into two parts—the inflated base and the elongated blade. The flowers shade from yellow to purple and are borne on stems shorter than the leaves. The plants are suitable for shaded or partially shaded locations. They may be used as accent plants in the foundation plantings or mixed with other foliage plants or shrubs in a border planting.

Propagation is by division or cuttings of the rhizomes which may be planted directly in the soil at the place where the plant is desired.

Alocasia macrorhiza Schott

Giant Alocasia (fig. 7)

"Panamá"

Araceae

This ornamental foliage plant, together with its variegated variety (fig. 7, *B*), has erect sagittate pointed leaves of great beauty and coloring. The prominently veined leaves sometimes reach 3 feet in length and the plant 10 or 15 feet in height. In the variegated variety the leaves are variously blotched with creamy white and sometimes almost a pure white leaf is produced. The thick stem which attains a height of 15 inches is covered with leaf scars and crowned with the long sheathed petioles. In the Philippine Islands, Fairchild (8) observed a form 20 feet tall with leaves often 8 feet long and 4 feet across.

The giant alocasia is useful wherever a large quick-growing herbaceous plant is desired. The green variety does well in full



Figure 6.—The metallic purple foliage of *Alocasia indica* var. *metallica* makes it a striking ornamental for landscape use.

sun or partial shade but the variegated variety develops more handsome foliage in partial shade. They may be used in groups with other plants in tall borders, as foundation plants, or as accent plants by doorways or corners. The variegated variety is often grown in pots for the patio.

The giant alocasia is propagated by suckers or cuttings of the rhizomes placed in a shaded propagation bed until ready to transplant. It grows best in fertile, well-drained moist soil and responds to fertilization with well-rotted cow manure.



Figure 7.—Plants of *Alocasia macrorrhiza*, A, often grow 10 to 15 feet high. The variegated variety, B, has leaves marked with large blotches of creamy white.

Alpinia antillarum R. & S.
Synonym: *A. racemosa* Sw., not L. (fig. 8)
Zingiberaceae

This native plant of the Greater Antilles is sometimes cultivated as a garden plant. In size and foliage the plants resemble those of *Alpinia sanderae* except that the variegated leaves are lacking.

Each leafy stem is terminated by a slender inflorescence consisting of a crimson rachis, bracts, pedicels, and calyces from which are borne the $\frac{3}{4}$ -inch tubular white flowers.

The flowers are followed by shining red fruit about $\frac{3}{8}$ inch in diameter which turn black upon ripening and remain on the plant for considerable time. The plants are almost as ornamental in fruit as in flower.



Figure 8.—*Alpinia antillarum* produces waxy flowers from red spikes which are followed by shining black fruit.

Propagation is by division of the rhizomes or by seed, which is produced freely. In the Greater Antilles plants may be secured from moist mountain forests and ravines.

Alpinia purpurata (Vieill.) K. Schum.
Red Ginger (fig. 9)
Zingiberaceae

The red ginger is a native of Pacific Islands from the Moluccas to New Caledonia and also of Yap Island. It is commonly planted in some tropical areas but is scarcely known in Puerto Rico.

The perennial stems reach a height of 5 to 12 feet and bear numerous alternate elliptical leaves about 1 foot long. The clumps



Figure 9.—A, The showy dark-red inflorescences of *Alpinea purpurata* are produced throughout the year. A recently expanded inflorescence is shown at *a*, fully expanded at *b*, and an old inflorescence at *c* with adventitious plants developing from the lower bracts. B, The plants are suitable for foundation or border plantings.

present an attractive appearance to the ground and are in flower most of the year. Each stem is terminated by a showy dark red cone-like flower spike 6 to 12 inches long. The showiness of the red ginger is due to the large open bracts which subtend the inch-long inconspicuous white flowers. These bracts persist long after the flowers have faded. The red ginger is suitable for foundation or border plantings or clumps may be placed among shrubbery or other perennial plantings. The spikes make excellent cut flowers and last well when taken into the house.

The plants grow best in partial shade but will tolerate full sun if given a rich soil and plenty of moisture.

Propagation is easily accomplished by division of the clumps or more rapidly by adventitious plants which arise from the axils of the bracts of the inflorescences. These plantlets may be set directly in the ground or started in pots or a nursery before they are planted out.

Alpinia sanderæ Hort.
Synonym: *A. vittata* Hort.
Banded Galangal (fig. 10)
"Jengibre de Jardín"
Zingiberaceae

The actual botanical position of *Alpinia sanderæ* is uncertain (2). The plants grown in Puerto Rico under this name resemble *A. purpurata* in habit except that the stems and leaves are not so vigorous in growth. This plant is grown for the ornamental effect of its leaves which are pinnately banded and blotched with white. The undulated leaf margin also may have a narrow white band. The leaves vary from 1 to 2½ inches in width and 6 to 14 inches in length. The 1½-inch waxy white flowers are borne in a 5- to 7-inch terminal inflorescence. Subtending the side spikelets from which several flowers are borne, one at a time, are two sessile ovate bracts about 1 inch in length. These bracts are bright red with splashes of green which fade to pink or white and green as they age.

Under good conditions the plants reach 6 feet in height. Best growth is obtained in a rich moist soil. Fully or partially shaded locations seem to increase the beauty of the leaves. If moisture is sufficient the plants grow well under trees. Otherwise, they are apt to become straggly during the dry season. Propagation is by division of the rhizome.

Alpinia speciosa (Wendl.) K. Schum.
Synonyms: *A. nutans* (Andr.) Rose.
Languas speciosa (Wendl.) Small
Shellflower, Shellflower Galangal, Shell Ginger (fig. 11)
"Boca de Dragón," "Pimienta Angola"
Zingiberaceae

The highly attractive shell ginger greatly resembles the red ginger but has larger stems and more vigorous growth. Originating in eastern Asia, its culture has spread to practically all tropical areas. The foot-long, sweetly scented flower clusters are borne

terminally on leafy stems which grow from underground rootstocks and may reach 10 feet in height. The clusters are crowded with waxy white or pinkish shell-like flowers about 1 inch wide by 2 inches long. The prominent lip is yellow inside with a heavy



Figure 10.—A, The waxy white flowers of *Alpinia sanderae* are borne in a terminal inflorescence from beneath red bracts. B, The plants are grown mostly for the ornamental effect of the variegated foliage.



Figure 11.—The long drooping flower clusters of *Alpinia speciosa* somewhat resemble strands of pink shells.

stain of red in the throat. The pendant undeveloped tip of the inflorescence together with numerous pink-tipped inflated calyces give a gracefulness to this otherwise stiff flower.

The shell ginger is of easy culture but does best in partial shade and rich damp soil. It grows well along pools and streams but may be used effectively as a foundation planting or tall border. In Asia the leaf sheaths are a source of fiber for rope and paper is also made from the plant. The aromatic foliage and ginger-like appearance probably account for the Spanish common name of Angolan pepper.

The plants are easily propagated by division of the rhizomes or by seed when it is produced. The principal flowering season is spring and summer with scattered flowering at other seasons.

Anomum sp. (fig. 12)
Zingiberaceae

This handsome foliage plant was collected in the Philippine Islands by the Archbold-Fairchild Expedition of 1939. Since then

it has been propagated and distributed to interested gardeners and institutions by the United States Plant Introduction Garden at Coconut Grove, Fla.

The plant produces annually masses of leafy stems about 3 feet in height. Toward the end of the rainy season the cone-like spikes of flowers appear on separate stems from the rhizomes. From between the glossy reddish bracts of the inflorescence appear the small white flowers, but the spikes retain their attractive appearance long after flowering stops.

The *Amomum* grows best in a rich moist light soil in semi-shaded locations. It is perhaps too spreading to be planted in patios but is adapted to the foreground of large borders or for naturalizing under trees.



Figure 12.—The cone-like inflorescences of this *Amomum* species are produced on separate stems during the rainy season.

Propagation is by division of the rhizomes and should be done just before the plants start into growth at the beginning of the rainy season.

Anthurium acaule (Jacq.) Schott

Lace-leaf (fig. 13, *a*)

"Flor de Culebra," "Hoja de Costado," "Moco de Pavo," "Rabo de Rata"

Araceae

The genus *Anthurium* comprises about 500 species and varieties native to the warmer parts of Central and South America and the

Caribbean Islands. Most of them are terrestrial or epiphytic perennial herbs but a few are climbers. Anthuriums are beautiful tropical Aroids which fall naturally into two sections or groups—foliage and flowering. The Puerto Rican species fall into the former group.

Anthurium acaule, which is native to Puerto Rico, is often found growing upon rocks or tree trunks on shaded mountainsides. The plants bear oblong lanceolate leaves 16 to 32 inches long and $2\frac{1}{2}$ to $10\frac{1}{2}$ inches broad, which are narrowed at the apex and base. Its chief attraction is the bright red berries which are closely set along the slender spadix. Even when the plant is not in fruit, the



Figure 13.—*Anthurium acaule*, lower left, is grown for its attractive green foliage and red fruit shown at *a*; *A. longilaminatum*, *b*, for the tropical effect of its foliage; and *A. scandens* (background) for its foliage and fruit, *c*.

clean green leaves are attractive and add considerable interest to a collection of tropical plants. When cut the leaves have exceptional keeping qualities. On the plant during the rainy season the soft tissue of the basal leaves is sometimes consumed by bacteria, leaving the lacy vascular skeleton. This probably accounts for the name "lace leaf."

Propagation is by seed but wild plants can usually be obtained in the Caribbean Islands where it occurs. In cultivation the plants can be grown in pots, raised beds, or epiphytically in humid sections.

Anthurium andraeanum Lind.
Anthurium, Flamingo Flower (fig. 14)
"Anturium"
Araceae

This species is probably the most showy and the most frequently cultivated of the flowering type. It is grown for the showy scarlet or pink waxy spathes and spadices. The pink variety is more common in cultivation. Numerous hybrids have been produced between this and similar species. They are all similar except for size and



Figure 14.—Flowers of *Anthurium andraeanum* will last for 2 months on the plant or for 6 weeks as cut flowers.

color of the flowers, which may vary from near white to pink, orange, or dark red. The species and its hybrids are cultivated in greenhouses in temperate climates and outdoors in tropical areas for cut flowers. Extensive plantings have been made in Hawaii for shipment to the mainland. This industry is based on the excellent keeping qualities of the flowers. Individual blossoms will last for 2 months on the plant or for 6 weeks as cut flowers.

The long-petioled cordate green leaves of this species are attractive but not as showy as in several species of the leafy type.

The plants do best in semishade with high temperatures and humidity. Daily syringing of the foliage during dry periods is beneficial. They are best grown in pots with a soil mixture which contains a considerable quantity of rough fibrous material such as crushed treefern root and leafmold. In Hawaii (6, p. 257) the plants are potted in nothing but the peelings of taro (*Colocasia* spp.). Since anthuriums are sensitive to strong sun and wind they must be grown in sheltered spots in the garden or patio. Lath or garden houses are ideal in the Tropics and here they can be grown in well-drained raised beds.

Propagation is by seed or by suckers which form about the base of old plants. Old plants which have grown considerably above the pot can be severed and rooted again in sand, leaving the base undisturbed to produce a crop of sucker plants.

Another flowering species, not illustrated, is *Anthurium scherzerianum* Schott, which differs from *A. andraeanum* in having lanceolate leaves and curled spadices.

Anthurium longilaminatum Engl.
"Lengua de Vaca" (fig. 13, b)
Araceae

This species represents a group of leafy anthuriums of great similarity which may grow to very large size in a good location. The plants are very short stemmed with stout petioles 2 to 3 inches long. The long-lanceolate leaf blades measure $3\frac{1}{2}$ to 12 inches wide and from $1\frac{1}{2}$ to 4 feet long. Mature leaves have exceptional keeping qualities when cut from the plant.

Flowers and fruit are scarcely ornamental in these species. They are greenish or brownish on 1- to 2-foot stems.

These plants may be grown either in pots or jars for the patio or upon the trees in the garden. In moist shaded locations the bright green leaves reach the largest size. The large plants present a decided tropical effect in the garden.

Propagation is by seed. In regions where they occur naturally plants may be brought in from the wild.

Anthurium magnificum Lind. (fig. 15)
Araceae

Perhaps the most beautiful of the foliage anthuriums is *Anthurium magnificum* which has large velvety green cordate leaves with silvery-white markings along the veins. The leaves which may reach a length of 24 inches and a width of 15 inches are borne on angled petioles as long or longer than the leaves. Like others of this group the flowers are of secondary importance consisting usually of a rough green spadix 9 inches long subtended by a narrow green or purplish green spathe about 6 inches long. The beauty of this plant is in the foliage.

For best development it is advisable to keep the plants in large well-drained pots. The soil mixture should contain a considerable quantity of rough fibrous material such as crushed treefern root. If this is not available, sphagnum, charcoal, and sand may be added to the mixture. For best development of the foliage the plants should be kept in a shaded corner of the patio or garden where they will receive some wind protection. They may also be planted in well-drained beds along foundations or in patios receiving sufficient shade.

Propagation is by suckers or cuttings of the rhizome which may be potted directly in a more fibrous mixture than that described above. Propagation may also be accomplished by seed which should be sown on spagnum moss in a glass-covered frame. When the first leaves of the plantlets are large enough to handle



Figure 15.—*Anthurium magnificum* is grown for the ornamental effect of its large velvety leaves.

they should be transplanted to individual pots and given a little more air to prevent damping off. Development is slow but the plants will eventually produce good specimens.

Anthurium scandens (Aubl.) Engl.
"Guinda" (fig. 13, c)
Araceae

This anthurium is native to most islands of the Antilles and continental tropical America. It is a climber with rather slender stems which are surrounded by fibrous sheaths. The alternate glossy green petioled leaves measure $1\frac{1}{2}$ to $3\frac{1}{2}$ inches in width by 5 to 8 inches in length.

Mature plants bear inconspicuous green and white inflorescences in the axil of each new leaf. The white spadix is about 2 inches long. A greenish spathe about $1\frac{1}{2}$ inches long by $\frac{1}{2}$ inch wide grows below and at right angles to the spadix.

Clusters of glistening white or violet globose berries follow the flowers and remain attractive for some time.

The plants will grow in pots or epiphytically in areas of abundant rainfall. In fact the best use of them is probably to bind sphagnum moss about the roots and place the plants upon trees in the garden.

Propagation is by seed, cuttings, or division. Where they occur naturally, plants may be brought in from the forest.

Aspidistra lurida Ker-Gawl.

Synonym: *A. elatior* Hort.

Aspidistra (fig. 16)

Liliaceae

This old-fashioned parlor plant of northern climates is grown as a garden plant in the Tropics for its stiff, shining foliage. Originating in China the aspidistra has become widely distributed. The 15- to 20-inch, long oblong-lanceolate leaves are sharp pointed



Figure 16.—*Aspidistra lurida* is grown for its attractive green foliage and is a good subject for pots or urns.

and narrowed at the base into a long channeled petiole. The leaves arise singly from the thick, usually creeping, rhizome. Lurid purple flowers are borne singly on short scapes which arise from the rhizomes and are apt to remain unnoticed among the leaves. Unlike most plants of the lily family the flower parts occur in fours instead of threes.

The aspidistra may be grown as a pot plant for the house or planted directly in the ground as a bedding plant. It grows best in shade and may be used around the base of trees and in front of shrubs. It also may be planted along streams and ditches and is used in this way in the Gulf States of the southern United States (29). The leaves make an excellent green for mixing with cut flowers and may be dried for use in dried bouquets. A white and green variegated variety is often grown but must have a poor soil or the foliage will become entirely green. Although not especially particular as to soil, the green variety will produce the best growth in a moist soil enriched with animal manure.

Propagation is by division of the rhizomes and attached leaves. It is best done when the plants start active growth at the beginning of the rainy season.

Bromelia pinguin L.
Penguin Bromelia (fig. 17)
"Maya"
Bromeliaceae

This large, spiny, pineapple-like plant that grows naturally in the scrub forests which occur in various parts of the Caribbean



Figure 17.—Plants of *Bromelia pinguin* form large rosettes of spiny leaves. Juice from the fruit is made into a refreshing drink.

area, is native to the West Indies and continental tropical America, but has become widely distributed in the Tropics. Its leaves are the source of a hard fiber known as pinguin.

The plants form large rosettes of erect or spreading, linear leaves 6 to 7 feet in length and about 2 inches in width. The yellowish green leaves are edged with stout sharp spines which point either forward or backward. Several bright red leaves develop with the inflorescence, which is a conical panicle shorter than the leaves. The stout main stem of the inflorescence is covered with a white mealy substance. Each inch-long white or reddish flower has its separate stem and is subtended by a narrow bract. The fruit is an ovoid-beaked yellow berry, 1 to 2 inches long, from which the acid juice is squeezed to make a refreshing drink.

In Puerto Rico the "maya" is planted along cattle fences and boundaries where it makes an effective barrier against all kinds of livestock. The plants seem to grow well on all soil types and with rainfall of 20 to 80 inches per year in Puerto Rico. Although the plants seem to grow best in semishaded locations, they are seen in full sun also. Propagation is by sucker plants or by seed.

Caladium bicolor Vent. and *Caladium* hybrids
Fancy Leaf Caladium (fig. 18)
"Paleta de Pintor," "Caladio"
Araceae

Caladiums are tuberous rooted plants grown for the effect of their highly colored sagittate leaves which are variegated in numberless ways with pink, red, white, yellow, and shades of green. The leaves are borne on stalks 1 to 2 feet in length which are either green or variegated in some varieties. In most cultivated varieties the leafstalk joins the leaf in the center or toward the base which is partially closed between the two lobes. Whitish flowers which somewhat resemble the common calla appear with the new leaves or soon after these leaves develop in the spring. The plants are perennial herbs which produce a new set of leaves annually from an underground tuber. A number of particularly handsome varieties have been named but they are difficult to distinguish and are often confused. Practically all of the present types and varieties originated in the nurseries of Adolph Leitze of Rio de Janeiro, Brazil. His Portuguese variety names were so difficult that many have been renamed in other countries and this has resulted in considerable confusion. For excellent pictures and descriptions of several modern varieties refer to Morrison (19). Many of these varieties are really hybrids of this and other species but the exact parentage is not known.

Caladiums are particularly adapted to moist, shaded locations in the garden where the leaves add color and flowering plants do not usually blossom well. The tubers may be planted directly in the soil but should be covered at least 1 inch deep as the new roots are formed from the top of the tuber. They are particularly adapted for a mixed border or foundation planting where the foliage of other plants can hide the ground while the caladiums

are dormant during the dry season. The plants may be cultivated in pots or urns to decorate the house or patio. Potting is usually recommended for tubers which have been in storage. As they start into vigorous growth they can be shifted to the permanent location. A well-drained soil consisting of about one-fourth well-rotted animal manure is recommended.



Figure 18.—The leaves of *Caladium bicolor* are variegated in numberless patterns. The flowers shown are of secondary importance.

Propagation is easily accomplished by division of tubers. Large tubers can be cut into several pieces with a sharp knife, and each piece will produce a new plant. In the Tropics the plants seed rather freely and many new varieties and hybrids have originated either by chance or intentional crossing. In some tropical and subtropical areas such as Brazil, Puerto Rico, and southern Florida considerable acreage is devoted to propagation of the tubers for sale locally or to temperate countries where they are grown as greenhouse plants.

Calathea lietzei E. Morr.

Synonyms: *Maranta conspicua* Bull., *M. neubertii* Hort.

Lietze *Calathea* (fig. 19, A)

Marantaceae

Calatheas belong to the arrowroot family which includes 26 genera and 360 species, mostly from swamps and damp lowland forests of the Western Hemisphere Tropics. A few species are



Figure 19.—Since flowers are often lacking under cultivation, plants of the arrowroot family are usually classified on leaf characters. *Calathea lietzei* is shown at A, and *C. vandenheckei* at B.

also known from Africa. Plants of this family can usually be distinguished by a node-like swelling or callused area of the petiole, above which the leaves usually set obliquely to the main petiole. For a key to the ornamental species of *Calathea* based on leaf

characters refer to Bailey (2). This genus is often confused with *Maranta* because of the great similarity of the foliage upon which the plants are usually described.

Calatheas are perennial plants mostly with short unbranched stems from which the usually long petioled leaves arise. They are grown for the ornamental effect of the foliage which is variously marked with shades of green, red, brown, yellow, and white. A few species are grown for their edible tubers. In Puerto Rico, *Calathea allouia* (Aubl.) Lindl., the "lerene," is cultivated in moist river valleys and the 1- to 2-inch potato-like tubers are considered a delicacy.

Among the ornamental species, *Calathea lietzei* is frequently grown as a pot plant in Puerto Rican homes or is sometimes planted as an edging for tall borders. It is dwarf in habit, usually not exceeding 1 foot in height. Each growth bears three to seven undulate, elliptical leaves which are soft velvety green on the upper side, striped with dark olive green along the principal veins, and feathered with yellow green between the veins. The under-surface of the leaves is dull purple red in color except for the green margin. The yellowish flattened inflorescences are borne at the swollen nodes of the slender leafy stems which later become procumbent and produce runner plantlets. These plantlets produce roots and may be used in propagation. Stems vary from one to four nodes in length.

This species grows particularly well in shaded lath houses and may be used as a ground cover or edging for borders where orchids or other foliage plants are grown. The plants thrive on moisture and high temperatures but require good drainage and will soon die out if the soil becomes stagnant.

Propagation is accomplished by rooting the runner plants in sand which develop after flowering or by division of old clumps.

Calathea ornata (Linden) Koern.

Synonyms: *C. ornata* var. *roseolineata* Hort., *Maranta ornata* Lind.

Roseline Bigleaf Calathea (fig. 20)

"Zebrina"

Marantaceae

This calathea bears erect slender growths 2 to 3 feet high with one to seven leaves. It may become spreading with age but is more erect than most species. The elliptical leaves are $2\frac{1}{2}$ to 6 inches wide and 6 to 24 inches long. Callus areas of 2 to 4 inches join the leaves to the slender petioles. The shiny green upper surface of the leaf blade is marked between the principal veins with pink strips in the juvenile leaf, white in the adult, and when mature they may be entirely green. The undersurface is red purple and the midrib brown.

The flowers develop in a yellowish ovoid head which is borne on stalks almost as long as the leaves. The head consists of ovate bracts arranged spirally, each bearing several pairs of flowers.

The roseline bigleaf calathea forms graceful clumps when planted directly in the soil. It will stand more sun than other members of the genus but prefers partial shade and rich, moist



Figure 20.—Leaves of *Calathea ornata* are marked with pink stripes when young which turn white at maturity and green with age.

soil conditions. Propagation is by division of the rhizomes or by seed.

Calathea vandenheckei Regel

Synonyms: *C. picturata*, *Maranta vandenhecki*

Vandenheck Calathea (fig. 19, B)

Marantaceae

This species produces tufted plants 1 to 2½ feet high usually with two leaves per growth but varying from one to three. The elliptic or ovate leaves vary from 3 to 9 inches in length. The glabrous rich dark-green upper surface bears a wide silvery white stripe along the midrib, with an irregular line of the same color completely encircling the leaf blade. This banding varies from

leaf to leaf and may also be accompanied by narrow silvery bands along the lateral veins. Often entirely different leaf patterns will occur on adjoining growths of the same plant. The undersurface of the leaves is dull purplish red; the petioles reddish brown. The white flowers are borne from an erect narrow spike on a stem 3 to 15 inches high.

The best use of this species is as a large specimen pot plant for moist shaded corners of the patio or for inclusion with a collection of tropical plants in a lath house. It is propagated by division of the plants.

Calathea zebrina (Sims) Lindl.
Synonym: *Maranta zebrina* Sims
Zebra Plant (fig. 21)
Marantaceae

The zebra plant is probably the most popular and well known calathea in cultivation. It is a compact plant standing 1 to 3 feet high which produces 6 to 20 leaves per growth. The leaves, which measure about 6 inches in width by 12 to 24 inches in length, are rich velvety green on the upper surface with alternating bars of yellowish green and dark olive green. The undersurface is pale greyish green when young but reddish purple in the adult leaf.



Figure 21.—*Calathea zebrina* is grown for the ornamental effect of its large striped leaves.

The petioles, which are stouter than in most of the other species, are clasping for almost their entire length and are attached to the leaf by a callused area which does not exceed 1 inch in length. Although not often seen, the violet flowers develop in a globose head that is borne on a stem which seldom exceeds 4 inches in length.

The zebra plant is useful as a large specimen border plant or may be grown in a large pot or tub for the porch or patio. Like other calatheas it grows best in a rich moist but well-drained soil. Well-rotted animal manure may be incorporated in the soil mix-

ture or the plants may be watered occasionally with a solution obtained by soaking well-rotted manure in water. Propagation is by division of the underground rhizomes or by seed.

Canna coccinea Mill.
Scarlet Canna (fig. 22)
"Maraca," "Bandera Española"
Cannaceae

This species occurs naturally in Bermuda, the West Indies, and continental South America. It is the most common species to be seen growing in marshy places along roadsides and ditches in



Figure 22.—*Canna coccinea* produces attractive green leaves and small but attractive scarlet flowers.

Puerto Rico. The slender stems are 3 to 6 feet in height with oblong-lanceolate to oblong ovate green leaves 3 to 6 inches wide and 10 to 20 inches in length. The flowers are borne in an usually simple terminal raceme. The $\frac{1}{2}$ -inch lanceolate sepals are green tinged with red. Petals are lanceolate, acuminate, $\frac{1}{2}$ -inch long, and pale scarlet. The small lip is red with yellow spots. Almost every flower is followed by an inch-long 3-valved capsule which

is covered with short thick papillae. Each capsule produces several hard round black seeds which are used in the "maraca," a musical instrument for marking time.

The plants are sometimes combined with other foliage plants in garden boundaries and in the West Indies often grow naturally along boundary fences. Best growth is produced in regions with moist soils in either full sun or shade. Propagation is by seed or by division of the usually stout rhizome.

Canna edulis Kerr.
Edible Canna
"Gruya"
Cannaceae

This native plant of the West Indies and South America has a thick starchy rootstock which is edible but is considered a low-quality food. It produces stout purple stems 8 to 12 feet tall and large oblong green or bronze leaves 1 to 2 feet long. The flowers are produced in a terminal simple or branched raceme. The 1½-inch long flowers are bright red or orange with a red or yellowish lip. The plants are extensively cultivated in some parts of the Tropics for the starchy rhizomes and are often seen as dooryard plants. The bronze foliage is attractive in combination with other foliage plants.

The edible canna grows best in a rich moist friable soil with full sun or partial shade. Propagation is by seed or division of the rhizomes.

Canna spp.
Garden Canna (fig. 23)
"Cana," "Maraca"
Cannaceae

The garden canna has been produced by crossing various species, mostly from tropical America, and it is not always possible to determine which are represented in a given variety. The varieties vary from dwarf plants of not over 2 feet to vigorous strains as tall as 8 feet. Foliage may be green or light- or dark-bronze, according to the variety. All bear large iris-like flowers in terminal racemes or panicles. The showy parts are the petals and staminodia one of which forms a showy lip usually differently colored. Yellow, orange, pink, red, and white are the predominant colors with some varieties having several colors combined. Several races are recognized such as the orchid flowering cannas and French cannas.

Garden cannas are commonly used as bedding plants for the tropical appearance of their foliage and bright flowers. They grow best in full sun with a rich friable moist soil.

Propagation is by division of the underground parts. An old plant may be divided into as many parts as there are buds on the rhizomes. Propagation by seed is also possible although germination is often slow unless the seed coat is cut or notched with a file. Most of the horticultural varieties do not come true from seed and should be purchased from nurseries.



Figure 23.—The foliage of *Canna* spp. is green or bronze; the showy flowers yellow, orange, pink, red, or white.

Colocasia esculentum (L.) Schott
Dasheen, Elephant's Ear
"Malanga"
Araceae

The dasheen is a perennial herb with cordate peltate leaves. Although usually grown as a food crop in the Tropics, the plants are strikingly ornamental and are often used as summer bedding plants in temperate climates. The types most commonly cultivated

in the Tropics bear a great resemblance to *Xanthosoma caracu*, page 83. The main distinguishing difference in the foliage is that the dasheen has a partially closed leaf sinus whereas in the *Xanthosoma* it is open to the junction of the petiole. In *Colocasia* also the edible tubers usually attain a much larger size than in *Xanthosoma*.

The dasheen grows especially well in the moist friable soils found along rivers and streams and will grow in shallow water as long as the water is not stagnant. It will grow in full sun or partial shade.

Propagation is by means of small corms which develop around the base of the old plants.

Colocasia sp. (fig. 24)
Araceae

Although of uncertain botanical position, this plant is highly ornamental and is particularly useful in the garden. The velvety green leaves, which are heavily marked with purple between the side veins, grow up to 20 inches long by 10 inches wide and are



Figure 24,—This *Colocasia* grows well at the margin of streams or pools.

borne on slender purple petioles. The bright yellow flowers are borne on stalks about half as long as the petioles. The elongated spathe is rather tightly clasping around the spadix.

The plants grow best in moist or swampy soil and for this reason are well adapted to planting at the margin of streams or pools.

Propagation is by means of the small plants, which are freely produced at the end of the slender rhizomes.

Cordyline terminalis Kunth
Ti, Common Dracena (fig. 25, A)
"Bayoneta"
Liliaceae

Two genera of the lily family, *Cordyline* and *Dracaena*, are grown for the ornamental effect of their foliage. Plants of both genera are commonly called "Dracena." Both include trees and shrubs usually with branched stems which are crowded apically with the elongated often variegated large leaves. As stems age



Figure 25.—A, *Cordyline terminalis* resembles a cluster palm in growth. Terminal whorls of leaves are borne on slender stems ringed with leaf scars. B, *C. terminalis* var. *tricolor* Hort. has leaves variegated with green and red and banded with white.

they become woody and ringed with leaf scars. The distinguishing characters between the two genera are minor and are based upon *Cordyline* having solitary pedicels with three bracts and several

ovules in each cell, whereas in *Dracaena* the pedicels are usually in twos without or with only one or two bracts and with solitary ovules in each cell.

Cordyline terminalis is native to tropical Asia, Australia, and New Zealand. It has been grown for many centuries in India and the islands of the Pacific. Plants of the Ti, as it is called in Hawaii, were standard equipment on all voyages of exploration by the Polynesians as it served many functions. The leaves were used for thatching roofs, making clothing, wrapping food for cooking, and many other uses; the roots were eaten and also fermented to make a strong liquor.

The wild variety usually has green leaves but a number of horticultural varieties differing in leaf color and markings have been selected and propagated. Some of these are variegated but the most colorful are full red or pink. *Cordyline terminalis* var. *tricolor* Hort. (fig. 25, B) has leaves variegated with red and green and banded along the margin with white. The leaves of the horticultural varieties vary from 1 to 2 feet in length. They are 2 to 4 inches wide, smooth and flexible. The leaf stems are channeled on top.

The small white, lilac, or reddish flowers are seldom seen and are not particularly showy. They are borne on branched clusters as in the palm family. The plants grow in a wide variety of soils and are adapted to both full sun and medium shade. They grow well from sea level to altitudes of about 2,000 feet but best growth and flowering occurs in cool, moist locations. The growth resembles that of some of the cluster palms whose stems are bare except for a tuft of leaves at the tip. Branching can be encouraged by occasional pinching of the growing point.

New plants are propagated from 2- to 4-inch sections of the stem, which are lightly covered with sand or loose soil and kept moist until new shoots develop from the nodes. Seed may also be utilized to produce new plants.

***Costus cylindricus* Rose.**
Spiralflag (fig. 26, A)
"Caña Amarga"
Zingiberaceae

This interesting genus of the ginger family includes about 100 species of wide distribution in the Tropics. They are usually fleshy stemmed plants with tuberous roots in some species. *Costus cylindricus* is native to the West Indies from Hispaniola and Puerto Rico to Trinidad and continental South America. The stout unbranching 4- to 12-foot stems are thickly set on the upper one-half to two-thirds of the main stem with leaves which are arranged spirally on the ascending stem. Young stems and weaker growths which often appear in crowded clumps may also exhibit a spiral twisting. The lower stem is clothed with sheathing bracts. The oblanceolate dark green leaves vary from 6 to 14 inches in length and 2 to 5 inches in width. Young foliage will sometimes be variegated with yellowish green. The leaves are attached by a short

woolly stalk to the curious ligulate sheath which on the upper part of stout stems is continuous between leaves in spiral fashion. At the apex of each stem is borne a cylindrical spike 3 to 8 inches in length and 1 to 2 inches in diameter. The spike is made up of smooth, dull red, overlapping bracts marked with stripes of yellow green, between which arise the inch-long yellow tubular flowers.

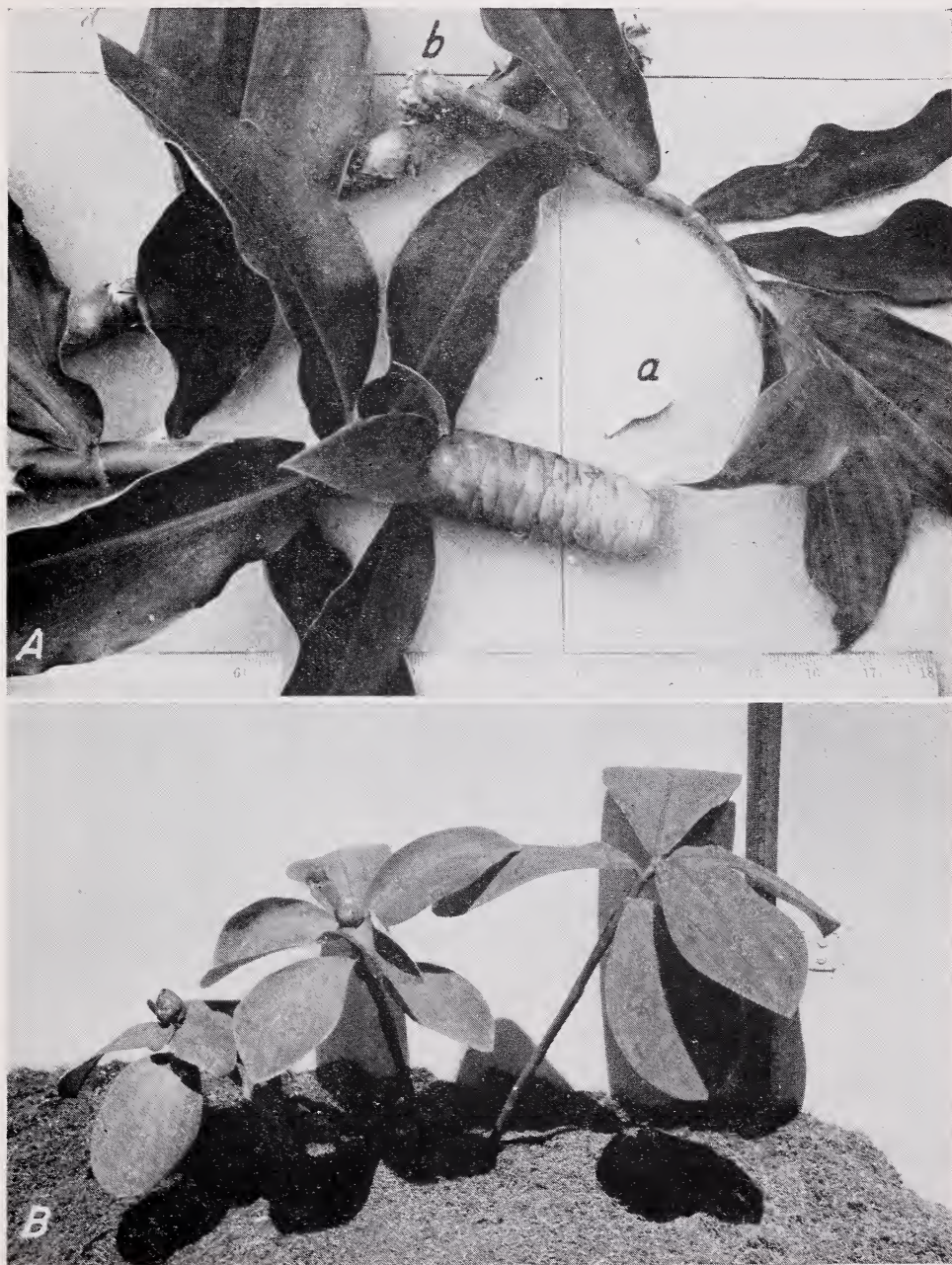


Figure 26.—A, Small tubular flowers, *a*, are borne from between the overlapping bracts of *Costus cylindricus*. Plantlets develop at *b*, below the old inflorescences. B, *C. malortieanus* is a dwarf plant with beautiful velvety leaves.

After flowering these bracts open and expose the brilliant red interior and the white triangular fruit still tipped with the pink calyx tube.

The spirallflag thrives in moist shaded or semishaded locations. It seems to reach its best development on the banks of streams or lagoons. Because of its size it may be used in the background of shrubbery plantings or may be combined with other large ornamental plants.

Seed, which is produced freely in this species, may be used in propagation. Young plants arise from the old stems just below the inflorescence as shown in figure 26, A, b. These plants may be removed and planted directly in the ground as roots usually form while the plantlets are still on the old stems. The old stems may also be cut into sections and laid horizontally in a propagation bed where each piece will produce a new plant. Old clumps may be divided but this method of propagation is much slower than by cuttings.

Costus malortieanus H. Wendl.

Synonyms: *C. zebrinus* Hort., *C. elegans* Hort. (fig. 26, B)
Zingiberaceae

This highly ornamental species produces clusters of stems 1 to 3 feet in height which arise from creeping ginger-like rhizomes. The stems are clothed with slightly inflated glabrous or hairy sheaths and crowned with a whorl of leaves. The leaves which measure 4 to 14 inches long and 3 to 6 inches wide are dark green, obscurely banded with yellowish green. They are clothed with hairs which are stiff and erect on the upper surface but soft and clinging on the lower.

Each stem produces terminally a 2-inch ovoid spike consisting of smooth, light green, overlapping bracts each marked with a line of dark green. The 3-inch-long flowers consist of a short calyx tube which bears 3 translucent lobes and a 3-parted corolla, the side lobes of which are reddish heavily veined with gold, and a 2-parted center lobe of golden yellow.

This low-growing costus may be grown as an ornamental pot plant or is suitable for low borders. Since it grows best in a rich moist soil, it is particularly adapted for planting beside pools or along streams. The foliage is most ornamental in partially shaded locations.

Adventitious plants appear in the axils of the lower bracts of old inflorescences and may be used for propagation. The plants may be propagated also by stem cuttings or division of the old plants.

Costus speciosus (Koen.) Smith

Canereed Spirallflag, Crepe Ginger, Malay Ginger (fig. 27)
Zingiberaceae

This native of India, Malaysia, and the Philippines is the most showy costus cultivated in Puerto Rico. It is of wide tropical distribution. The stout stems which vary from 4 to 10 feet in height

may become woody at the base. They are clothed below with sheathing bracts and on the upper one-half to two-thirds with oblong spiraled green leaves which have sheathing bases. These leaves which are covered with white hairs on the undersurface vary from 6 to 12 inches in length and 1 to 3 inches in width. Sometimes young or weak stems are also twisted spirally. The stems terminate in dense ovoid flower heads 2 to 5 inches long. These heads are made up of large reddish-purple bracts and



Figure 27.—The large white flowers of *Costus speciosus* are the most showy of the genus.

3-lobed calyx tubes. The beautiful funnel-shaped white crepe flowers with yellow throats that measure about 3 inches across are borne from each inflorescence over a long period.

The crepe ginger thrives in rich, moist soil and will stand almost full sunshine. Because of its size it is best planted in the background of other plants or it may be used as a tall screening plant for property boundaries or divisions.

Plants are readily propagated by cuttings of the old canes laid horizontally on the propagation bed and partially covered with the propagation medium. Division of the clumps may also be used, but this method is much slower than when cuttings are made.

Ctenanthe oppenheimiana Schum.

Synonym: *Calathea oppenheimiana* E. Morr. (fig. 28)
Marantaceae

This genus of Brazilian plants is closely related to *Calathea* and *Maranta*. It differs in minor botanical characters of flowers and fruit. It is a perennial herb with both basal and stem leaves which are 4 to 5 inches in width by about 1 foot in length. The upper leaf surface is alternately banded with red and green in pinnate fashion and the lower surface is solid reddish purple. The plants which stand 3 feet high greatly resemble *Calathea zebrina* except that they lack the velvety texture of the leaves and the petioles are much more slender. The flowers are crowded in terminal spikes.



Figure 28.—*Ctenanthe oppenheimiana* is a shade plant with red- and green-banded leaves.

The plants may be grown in pots like other members of this family or used in mixed plantings of foliage plants growing in shaded locations. Soil requirements are the same as for *Calathea* and *Maranta*. Propagation is by division of the rhizomes.

Cyperus alternifolius L.

Umbrella Flatsedge, Umbrella Plant, or Umbrella Palm (fig. 29)
"Paragüita"
Cyperaceae

The sedge family includes numerous species which occur from the Arctic to the Tropics. Two species of *Cyperus* are commonly



Figure 29.—Clumps of *Cyperus alternifolius* which resemble small palms are particularly adapted to wet soils.

grown for ornamental purposes. *C. papyrus* L., the Egyptian paper plant, is seldom seen in Puerto Rico but is grown extensively in other tropical and subtropical regions on the margins of streams and in damp soil.

Cyperus alternifolius is a perennial which grows in dense palm-like tufts with numerous stiff triangular stems 1 to 4 feet high. Each stem is crowned by a spiraled umbrella-like flowering head which consists of about 20 leaf-like bracts 4 to 8 inches long and of varying widths. The small numerous grass-like flowers are borne in brownish compound umbels among these leafy bracts. The umbrella plant is particularly suitable for planting along the banks of pools or streams. It may also be grown in pots or in moist locations in the garden. In some areas the triangular stems are used for weaving mats and baskets.

Propagation is by division of old clumps, seed, or by adventitious plants which arise from the old inflorescences.

***Dieffenbachia picta* Schott**
 Variable Tuffroot (fig. 30)
 "Rábano"
 Araceae

Dieffenbachias are thick-stemmed perennial plants from Central and South America and the Caribbean Islands. About 25 species are known but only a few are cultivated. The stems often become procumbent at the base but are upright at the tip with a leafy top. They are grown for the ornamental effect of the leaves, which are smooth and green or variegated with creamy white and various shades of green.

Dieffenbachia picta bears large oblong or elliptical leaves on long grooved petioles. The leaf blade is green with numerous irregular oblong or linear spots between the veins. Each leaf bears a prominent midrib with 15 to 20 pairs of prominent side veins. The inflorescence, which resembles that of *Aglaonema*, consist of an erect cylindrical flower spike enclosed by an open tubular spathe which is somewhat constricted near the middle. The fruit consists of several scarlet berries which are covered by the persistent bract. Several horticultural varieties have been selected which are more often seen in cultivation than the species. In *D. picta* "var. Rudolph Roehrs" the young leaves are almost entirely creamy white except for the green margin and midrib. As the leaves age a uniform light green color develops throughout the leaf. *D. picta* var. *bausei* Engl. is a hybrid between *D. picta* and *D. weiri*. The large yellowish green leaves of this hybrid are marked with irregular blotches of dark green and scattered white spots.

This plant is commonly grown in shaded gardens or potted for the house. For the garden it is usually best to group several plants as the stems tend to become bare and unsightly as the plants get older. If a few are pruned back at a time, the new shoots which arise will give foliage of varying heights to cover the bare stems of the old plants.

Propagation is by seed or cuttings. The tops of old plants may be rooted and the stems may be cut into sections about 3 inches long, dried for a few days, and placed in a propagation bed where they will produce new shoots. When these new shoots have rooted from the base they may be removed from the stem piece and planted.

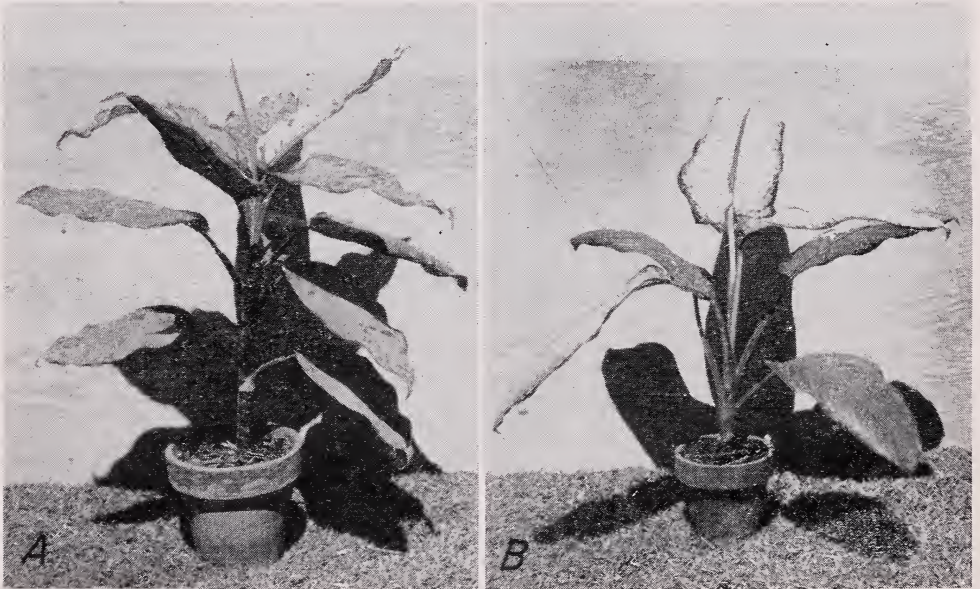


Figure 30.—A, *Dieffenbachia picta* var. *bausei* bears large yellowish-green leaves marked with blotches of dark green and white. B, In *D. picta* "variety Rudolph Roehrs" the young leaves are almost entirely creamy white but become green with age.

Dieffenbachia seguine (Jacq.) Schott
Dumb Cane, Seguin Tuftroot (fig. 31)
"Rábano Cimarrón"
Araceae

The dumb cane is native to the West Indies where it grows in shaded moist soils or even in shallow water. It is frequently seen in coffee plantations. This species is more vigorous in growth than *Dieffenbachia picta* and in the wild is frequently found in the green-leaf form. In the cultivated variety the foliage is spotted with creamy white. The cordate based oblong or elliptical leaves



Figure 31.—The leaves of *Dieffenbachia seguine* are pure green or spotted with creamy white.

vary from 3 to 6½ inches wide and 8 to 14 inches long and bear 9 to 17 pairs of prominent side veins. The pellucid dotted petioles are slightly grooved above. An open tubular spathe which is somewhat constricted near the middle surrounds the cylindrical flower spike.

The fruit consists of a cluster of scarlet berries. The slightly milky juice is said to be poisonous and it is said also that if parts

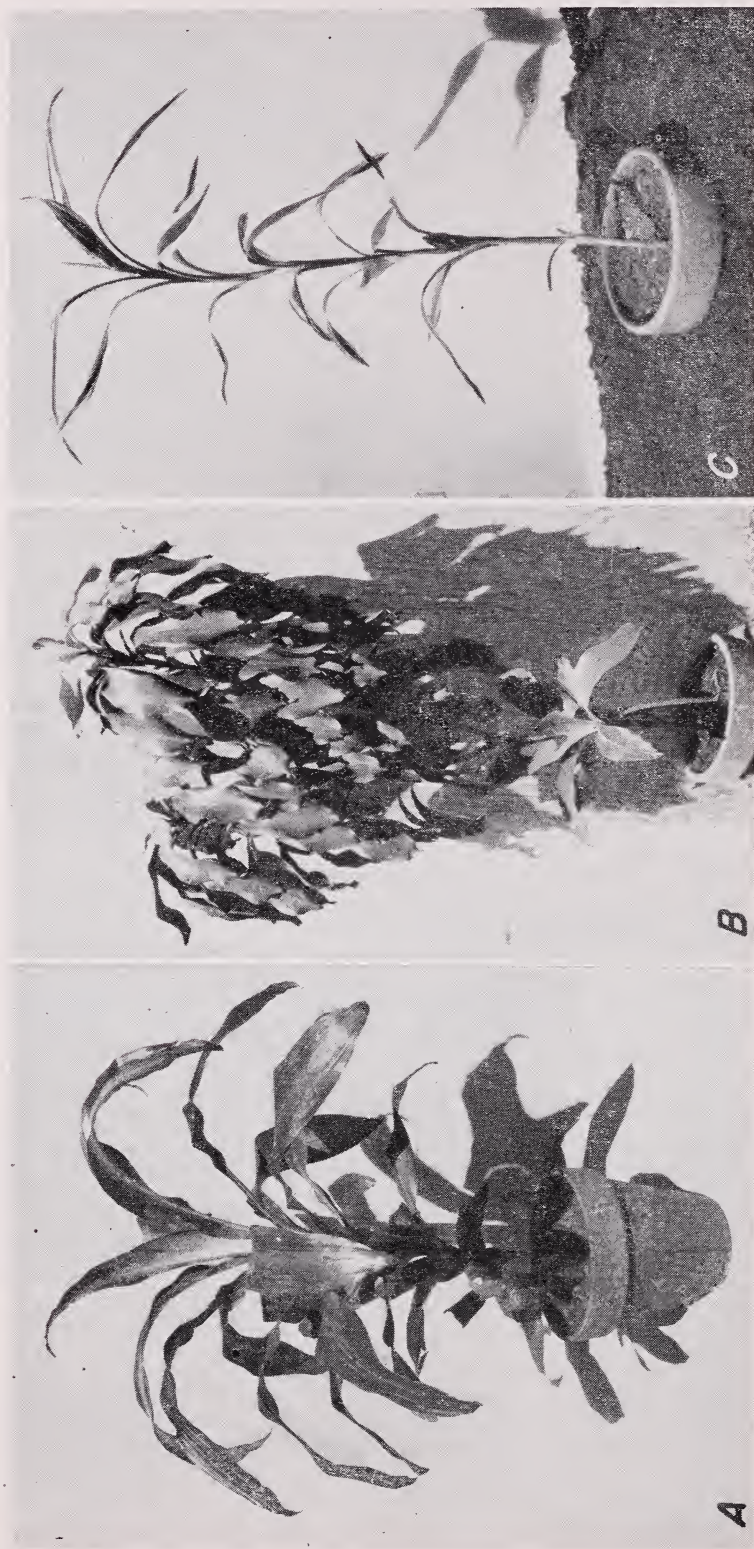


Figure 32.—A, *Dracaena fragrans* var. *massangeana* with its broad central leaf band of yellow is the variety most commonly seen in the Tropics. B, This variety has been hybridized with *D. godseffiana* to produce a plant of intermediate size with spotted leaves. C, *D. sandertiana* has slender stems and attractive green and white striped leaves.

of the plant are chewed they will cause one to lose his speech for several days—hence the name “dumb cane.” Propagation is the same as for *Dieffenbachia picta*.

Dracaena fragrans Ker-Gawl.
Fragrant Dracaena (fig. 32)
“Drecina,” “Cocomacaco”
Liliaceae

Dracaena includes about 40 species of tropical plants not all of which are in cultivation. Some of them become woody and live to a very old age such as the dragontree of the Canary Islands, *D. draco* L., and *D. aurea* Mann, of the Hawaiian Islands.

Dracaena is often confused with *Cordyline* but differs from the species described under that genus, page 39, in the character of its flowers and fruit. *D. fragrans* often attains 20 feet in height. The stems are heavily foliated with green shiny sessile leaves which measure $2\frac{1}{2}$ to 4 inches in width and $1\frac{1}{2}$ to 3 feet in length. The oblanceolate leaves are lax and spreading, with the pointed tip recurved. Two garden forms, variety *massangeana* Hort. and variety *lindenii* Hort., are more often seen in cultivation than the green-leaved species. The former bears a broad yellow stripe along the center of the leaf throughout its entire length. This stripe is especially pronounced in young leaves and may fade entirely to green as the foliage ages. Leaves of the latter are recurved and are transversed from base to apex by various creamy white bands. Several beautiful hybrids have been produced between these and other species. In figure 32, B, is shown a hybrid between the variety *massangeana* and *D. godseffiana* Hort., a shrubby species which is illustrated in Circular No. 34 of this series (12, pp. 58-59).

The flowers, which are fragrant at night, are borne in glomerate clusters from a branched terminal inflorescence and are followed by orange-red berries. *Dracaena* plants may be grown in pots or urns for the house or patio or planted directly in the garden, where they are useful as boundary or background plants.

Propagation is by seed or by cuttings. Cuttings consisting of 4-inch sections of the mature stems without foliage are placed horizontally upon the propagation bed and lightly covered with the moist medium. The sprouts obtained from these cuttings should be removed and rooted in sand before planting in pots or the garden. The plants obtained in this manner are smaller and are better adapted for the house or patio than those obtained by direct rooting of large stem sections.

Dracaena sanderiana Hort.
Sanders Dracaena (fig. 32, C)
Liliaceae

This slender species from the Congo is grown principally as a pot plant for the house or patio or is sometimes combined with other foliage plants in small corners of the patio or garden. The slender stems bear alternate narrowly lanceolate acuminate leaves on rather broad petioles. These glossy green leaves are broadly



Figure 33.—The foliage of *Dracontium polyphyllum* may reach a height of 6 feet during the rainy season.

banded or margined with white and measure $1\frac{1}{2}$ to $1\frac{1}{2}$ inches wide and 6 to 10 inches long.

The plants produce their best foliage effect in semishade as strong sunshine causes burning of the white parts of the leaf. Rich moist soil throughout the year is preferred.

Propagation is by 6- to 8-inch tip cuttings or by sections of the mature canes as for *Dracaena fragrans*. This species together with some similar species and hybrids is grown in large numbers in Puerto Rico for shipment to florists of the continental United States as unrooted cuttings.

Dracontium polyphyllum L.

Dragonaroid (fig. 33)

"Guapa"

Araceae

About 10 species of this odd genus are found in tropical America. This species occurs from Hispaniola and Puerto Rico to the Guianas. It is a stemless plant with a large underground tuber and a single prickly erect leafstalk 3 to 6 feet in height and as much as 2 inches in diameter at the base. The leafstalk is dark green, cross-banded with silvery white. The leaf has three primary divisions which are again compounded, the whole being circular in outline and about 30 inches in diameter. The foliage, which is produced during the rainy season, withers at the onset of the dry season and the curious flowers develop on short separate stems. The showy part of the flower is the oblong deep violet spathe which measures about 6 inches wide by 2 feet long and encloses a long purplish spadix.

The dragonaroid grows best in moist soils and semishaded locations. It may be combined with other foliage plants in the garden border where its palm-like foliage will be decorative during the rainy season and its odd flowers will add interest during the dry season. It is best to avoid planting this species in the patio or close to the house because the flower has an objectionable odor.

Propagation is by seed or offsets of the tubers which should be taken off as the plants start into growth in the spring.

Furcraea selloa var. *marginata* Trel.

Synonym: *F. lindeni* Jacobi

Stripeleaf Furcraea (fig. 34, A)

Amaryllidaceae

This succulent plant somewhat resembles an *Agave* with its leaves in a dense rosette and its occasional short trunk. The lanceolate green leaves, 3 to 5 feet long and 5 inches broad at the middle, bear short teeth along the yellow leaf margin. The concave under-surface of the leaf is somewhat roughened. Greenish flowers are borne on a tall glabrous branched stem which arises from the center of the rosette of leaves. Following the flowers numerous bulbils are produced which may be used in propagation.

This sturdy plant grows well on moist well-drained soils and although it will tolerate partial shade it reaches its best development in full sun. It is particularly useful in landscaping large properties and combines well with Spanish-style architecture.

Propagation is by means of the bulbils, which quickly develop into plants suitable for landscape use.

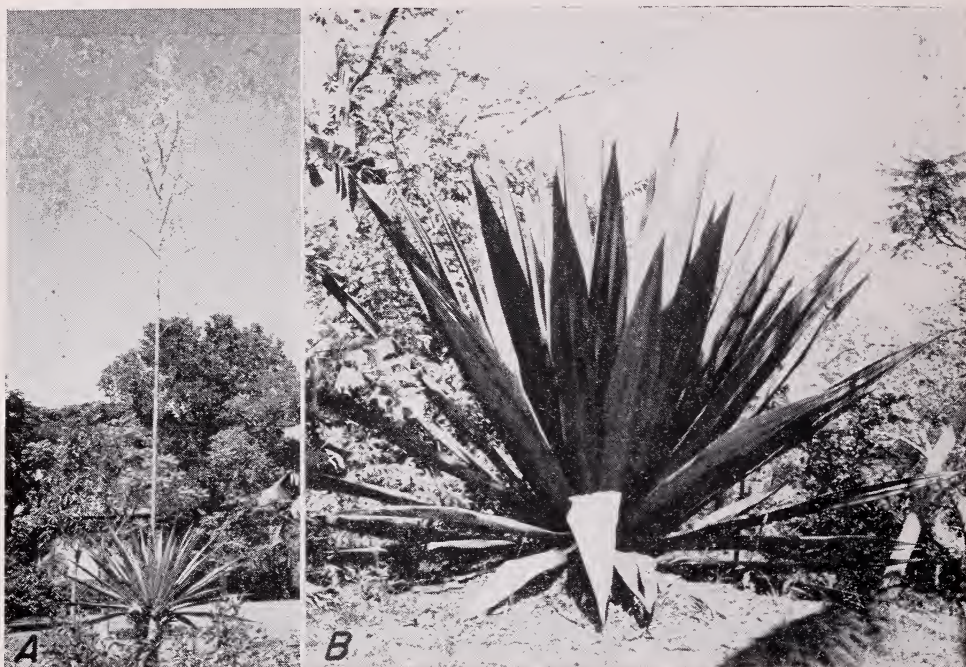


Figure 34.—A, The tall flower spike of *Furcraea selloa* var. *marginata* bears many small flowers followed by bulbils which grow into new plants. B, The leaves of *F. tuberosa* are spiny margined toward the base and tipped with a blunt point.

Furcraea tuberosa Ait. f.
Female Karata (fig. 34, B)
"Maguey Criollo"
Amaryllidaceae

These giant trunkless plants greatly resemble the centuryplant, page 8, and other agaves. They are native to Cuba and Haiti although in a somewhat different form, occurring from Hispaniola and Puerto Rico to Granada in the Lesser Antilles. In Puerto Rico the "maguey criollo" grows from sea level to 2,500 feet elevation, on coastal cliffs, rocky plains, dry thickets, and hillsides. The leaves of *Furcraea tuberosa* are broadly lanceolate, 4 feet or more in length, and as much as 8 inches broad at the middle. The leaves are margined with short spines toward the base and tipped with a blunt point.

At maturity the plants produce stout erect inflorescences from the center of the rosette of leaves. These stems may reach 25 feet in height and 6 inches in diameter at the base. Many greenish-white flowers are borne at the brached apex of the inflorescence. Fruiting is unknown but many elongated bulbils are produced following the flowers, which may be used in propagation. Soil and propagation requirements are the same as for *Furcraea selloa*.

Hedychium coronarium Koen.
White Ginger Lily, Butterfly Lily, Garland Flower (fig. 35)
"Jazmín Cimarrón," "Jazmín del Río," "Mariposa Blanca," "Narciso," "Nardo"
Zingiberaceae

The white gingerlily is from India but has been planted in many warm countries (17). In Hawaii, the flowers are used extensively

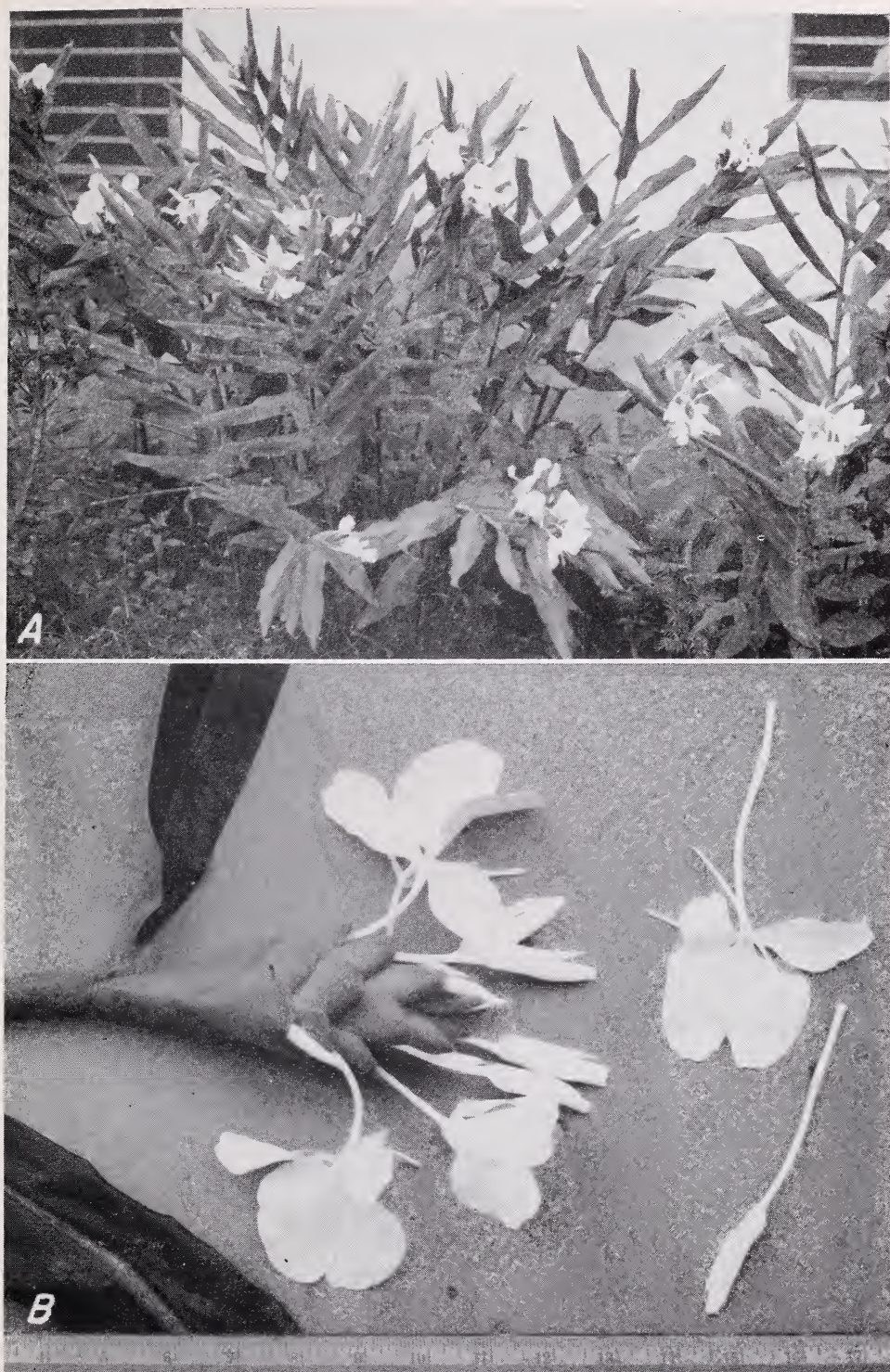


Figure 35.—A, *Hedychium coronarium* is suitable for border or foundation plantings. The fragrant white flowers, B, are borne in club-shaped terminal spikes.

for making leis and growing them has become an industry of considerable size. In Puerto Rico this *Hedychium* has become naturalized and large clumps may be seen along some of the interior rivers.

It is a medium-strong-growing herbaceous plant which may reach 6 feet in height. New foliage is produced each year from the perennial rhizomes at the beginning of the rainy season. The sessile oblong leaves are borne alternately along two sides of the stem. In size the leaves vary from 1 to 4 inches wide and 6 to 24 inches in length. Leaves are pubescent on the lower side.

The long tubed flowers arise from club-shaped terminal spikes, two to three to each bract. The individual flower is 3 to 4 inches across, pure white or with a green spot on the enlarged lip-like upper corolla segment. The flowers give off a heavy sweet perfume which is especially strong at night. At maturity the 1- to 2-inch orange fruit capsules split open revealing numerous shiny red seeds which remain on the plant for some time.

The white gingerlily does particularly well in moist soil along streams or ponds but also performs satisfactorily on higher ground. It grows well on a wide variety of soils but does best on rich soil. Barnyard manure may be used as a fertilizer. It may be used for naturalizing along streams on large properties or mixed with other flowers and shrubs in border and foundation plantings. It may be grown in either sunny or shaded sites.

Hedychiums are usually propagated by division of the rhizomes at the beginning of the rainy season, or from seed. The first method is more rapid and results in good growth and flowering the first season. Plants from seed take 2 years to bloom.

***Hedychium* hybrid (*H. flavum* Roxb. × *H. gardnerianum* Roscoe) (fig. 36)**
Zingiberaceae

This hybrid *Hedychium* is more slender than the preceding species, but it reaches 6 feet in height. The almost sessile leaves measure 2 to 2½ inches wide by 12 to 21 inches long. They are bright green on the upper surface and pale green below, with the midrib slightly haired. The terminal inflorescence, 9 to 15 inches long, is composed of slender cylindrical bracts from which arise several showy flowers. The outer segments of the flower are linear and rather inconspicuous, but the lip varies from tan at the edge to bright tangerine color in the throat with an elongated column of the same color. Inch-long capsules split at maturity to reveal a bright orange interior and red seeds.

Cultural requirements and propagation are the same as for *Hedychium coronarium*.

***Hedychium* sp. (fig. 37)**
Zingiberaceae

This species greatly resembles *Hedychium coronarium* in growth but the stems are usually stouter often reaching 7 feet in height. The almost sessile elliptical leaves are bright green on the upper surface. The underside is pale green and coated with soft



Figure 36.—This *Hedychium* hybrid bears bright tangerine-colored flowers during the rainy season.



Figure 37.—This *Hedychium* sp. bears pale yellow flowers that become pinkish when old.

appressed hairs. In size, the leaves vary from 3 to 4½ inches wide and from 12 to 24 inches long. Stems and foliage often show a russet appearance. The terminal inflorescence which measures about 6 inches long by 2½ inches wide bears at its base ovate bracts that are flat and overlapping and upper bracts that are cylindrical and distinct. The flower tube which is attached beneath the bracts measures about 3¾ inches. Flower buds are glossy yellow, opening pale yellow with a darker spot on the labellum. The slender column is greenish yellow bearing a single anther having an orange line around the edge. The entire flower becomes pinkish when old.



Figure 38.—*Heliconia bihai* is a tall banana-like plant with showy flower spikes.

Cultural requirements and use are the same as for *Hedychium coronarium*. Propagation is by division of the rhizomes at the beginning of the rainy season.

Heliconia bihai L.

Carib Heliconia, Balisier, Wild Plantain, Lobster's Claw (fig. 38)
"Guineo Silvestre," "Botecitos," "Guineo Cimarrón," "Pámpano,"
"Plátano de Indio"
Musaceae

This plant is native to continental tropical America and to the West Indies except the Bahamas. Large clumps of upright shoots are produced, 10 to 15 feet tall, with 4 to 6 large banana-like leaves per growth. These oblong leaves vary from 2 to 5 feet in length and 8 to 12 inches in width. They are borne on erect petioles 1½ to 3 feet in length on two sides of the flattened false stem. The leaves are usually glaucous green above and pale on the under-surface except for the prominent midrib which is marked with purple. Petioles and sheathing stems are purple spotted also. The inflorescence is borne on a short stalk from the center of the purple-spotted false stem made up of the overlapping bases of the petioles. It consists of several alternate boat-shaped bracts which are borne on two sides of the central rachis. Races from different localities vary in the shape, size, and color of these bracts.

In the type of heliconia most commonly seen in cultivation the bracts are scarlet with greenish-black margins and measure about 5 inches long by 1½ inches deep. Green, yellow, or scarlet bracted forms will be seen in the wild and sometimes in cultivation. The rather inconspicuous greenish or greenish-yellow flowers are borne inside the bracts which are usually full of water. A number of bluish capsules usually ripen in each bract. The plants flower during the latter part of the dry season and the early part of the rainy season and remain showy for several months. They are also very showy and durable as cut flowers. When used in this way, part of the false stem is cut to give additional length and the leaves are removed.

This heliconia grows best in rich moist soil in partial shade or full sun. Because of its large size, it is best planted as a background or border for property boundaries. In Trinidad the plants are sometimes used as temporary protection to young cacao trees and the cut stems for mulching.

Propagation is possible by seed but more commonly by division of the underground parts of the plant.

Heliconia edwardus rex Hort. (fig. 39, A)

Musaceae

This plant is grown for the ornamental effect of its foliage. The plants form dense clusters of leafy growths which arise from underground stems. Each growth is composed of 2 to 4 erect bronze to red banana-like leaves on 6- to 12-inch petioles. The petioles become clasping at the base to form a stem-like growth. The attractive elliptical to oblong leaf blades measure 1 foot wide



Figure 39.—A, *Heliconia edwardus rex* is grown for the ornamental effect of its bronze and reddish-purple leaves. B, The slender orange-red bracts of *Heliconia latispatha* give a graceful effect not found in other species. The lower bract usually bears a leaf.

by 3 feet long. Storms sometimes lacerate the leaves as in bananas. Although seldom seen, the inflorescence which is borne on a short stalk, consists of several overlapping reddish bracts from which the small individual flowers are borne. Since the inflorescence is

the same color as the leaves and does not rise above the foliage it may be easily overlooked.

The plants will grow in full sun or partial shade. Although a rich moist soil is preferred, they will perform satisfactorily in most locations. The clumps may be used in foundation or border plantings where they may be combined with other foliage plants or shrubs. Propagation is by division of the underground rhizomes.

Heliconia latispatha Benth.
Heliconia (fig. 39, B)
Musaceae

This species resembles *Heliconia bihai* in general characters of growth. The erect banana-like leaves which vary from 2 to 5 feet in length and 6 to 11 inches in width are more tapering at the tip. The inflorescence is borne on a stalk which arises 1 to 2 feet above the false stem formed by the clasping leaf bases. The false stem is less flattened in this species and both false stem and petioles are not so heavily spotted with purple as in *H. bihai*. The inflorescence consists of 9 to 11 elongated, slightly boat-shaped bracts which arise from several sides of the zigzagged center rachis and enclose the flowers. Bracts are orange red in color and measure 1 inch wide by 4 to 10 inches long. They remain attractive on the plant for several months. The short yellowish-green flowers are followed by numerous rounded capsules that develop in the lower bracts before the upper bracts have finished flowering. The lower bracts of the inflorescences often develop into leaves 1 to 2 feet in length. When young the inflorescences make excellent cut flowers and long stems may be secured by including part of the sheathed portion after removing the leaves.

The plants grow best in rich moist soil and may be planted along ditches and stream banks.

Propagation is by seed or by division of the underground stems at the beginning of the rainy season.

Kaempferia rotunda L.
Resurrectionlily (fig. 40)
"Ilang-ilang de la Tierra," "Duende Violeta"
Zingiberaceae

This native of the Old World Tropics is of unknown origin in Puerto Rico. It is cultivated to a limited extent as an ornamental plant and has escaped from cultivation in a few spots in the island.

The stemless, tuberous plants are dormant for 2 to 3 months during the dry season. In March or April the short-stalked fragrant flowers appear in clusters much like crocuses in temperate climates. The flower has narrow whitish corolla segments and a lilac-colored, two-parted lip about 2 inches long. Flowering is intermittent over a period of about 1 month.

Following the flowers the foliage appears and remains ornamental throughout the rainy period. When in foliage, the plants often attain a height of 30 inches. The leaves, which measure 12



Figure 40.—*Kaempferia rotunda* is grown for the ornamental foliage which is produced during the rainy season and the flowers which develop in the dry season.

to 17 inches long by 3 to 5 inches wide, are borne on short clasping petioles. The upper surfaces are silvery green with an irregular band of darker green along the midrib. The undersides and petioles are purple with closely pressed soft hairs.

The resurrectionlily is suitable for patios and edgings for border plantings. It should be combined with some low-growing ground cover which will cover the soil while the leaves are dormant.

Propagation is by division of the clumps which should be done as the leaves start into growth.

Maranta arundinacea var. *variegata* Hort.
Variegated Bermuda Arrowroot (fig. 41)
"Amaranta," "Maranta," "Pitisilén," "Yuquilla"
Marantaceae

Maranta arundinacea L. is grown in many tropical countries as a food plant. A fine, white, easily digested starch is obtained from the large underground tubers which may also be eaten as a vegetable much as sweetpotatoes. In Puerto Rico and other tropical areas, a variety frequently grown as an ornamental plant, has leaves variegated with cream or white. The slender erect plants vary from 1 to 3 feet in height. The oblong leaves vary from 2 to 3½ inches in width and 6 to 13 inches in length. The slender petioles are sheathing for one-third to one-half their length and are terminated by a callused area of about ½ inch. The variegation has no set pattern and appears either as marginal banding or blotches of creamy white between the veins. The upper

and lower surfaces are variegated independently thus creating an additional color in which a white blotch is underlaid by green. This banding may also appear in the petiole and extend into the midrib which terminates abruptly at approximately three-fourths the length of the leaf. Occasionally pure creamy white leaves are produced which persist on the plant for some time. The white flowers are borne in pairs at the tip of the branched stems.

The culture of marantas is the same as for calatheas. Best results are obtained in moist but well-drained fertile soil. For best development of the foliage the variegated variety should be grown in full or partial shade.

Propagation is by division of the crowns as they start into growth at the beginning of the rainy season.



Figure 41.—The variegation in leaves of *Maranta arundinacea* var. *variegata* appears in no set pattern. Pure white leaves are sometimes produced.

Maranta leuconeura var. *kerchoviana* E. Morr.
Redspot Arrowroot (fig. 42)
Marantaceae

This beautiful dwarf spreading species grows about 1 foot high. The broadly ovate or elliptical leaves are grayish green striped or banded along the veins with white and marked with darker green spots. The smooth undersurface is marked with red. Leaves which measure 4 to 5 inches in width by 5 to 8 inches in length are borne on short clasping petioles.



Figure 42.—*Maranta leuconeura* var. *kerchoviana* is a low spreading plant with dark green spots on the grayish green leaves.

This species is particularly adapted to pot culture but may be set in the foreground of a shaded border. It requires rich soil and good drainage. Propagation is by division of the plants.

Molinieria hortensis Britton (fig. 43)
Amaryllidaceae

This member of the amaryllis family has long-acuminate plaited leaves which may reach 4 feet in length and 6 inches in width. Leaf petioles are about one-half as long as the blade. The foliage greatly resembles a clump of palm seedlings and the plants are often mistaken for palms. Many flowers are borne in the short dense nodding head over a period of 1 to 2 months, only a few being open at a time. The star-like yellow perianth is subtended by hairy green bracts which are longer than the perianth segments.

This plant has been cultivated for so long in Puerto Rican gardens that its origin has been forgotten but it is thought to have come from Malaya or India (4, p. 161). The plants are well suited to foundation or border plantings and thrive in either full shade or partial sun. They are not partial as to soil but reach their best development where moisture is uniform throughout the year.

Propagation is by seed or by division of the old clumps at the beginning of the rainy season.

Musa nana Lour.
Synonym: *M. cavendishii* Lamb.
Chinese Banana, Dwarf Banana
"Guineo Enano"
Musaceae

The Chinese banana produces stoloniferous plants 4 to 6 feet or more high. Six to 8 leaves 1 foot wide and 4 feet long are borne in a dense terminal rosette. In flowering and fruiting the Chinese banana greatly resembles the common banana except that the flower bracts are usually larger and more fruit, up to 300, are produced in a bunch. The plants are more stocky than the common

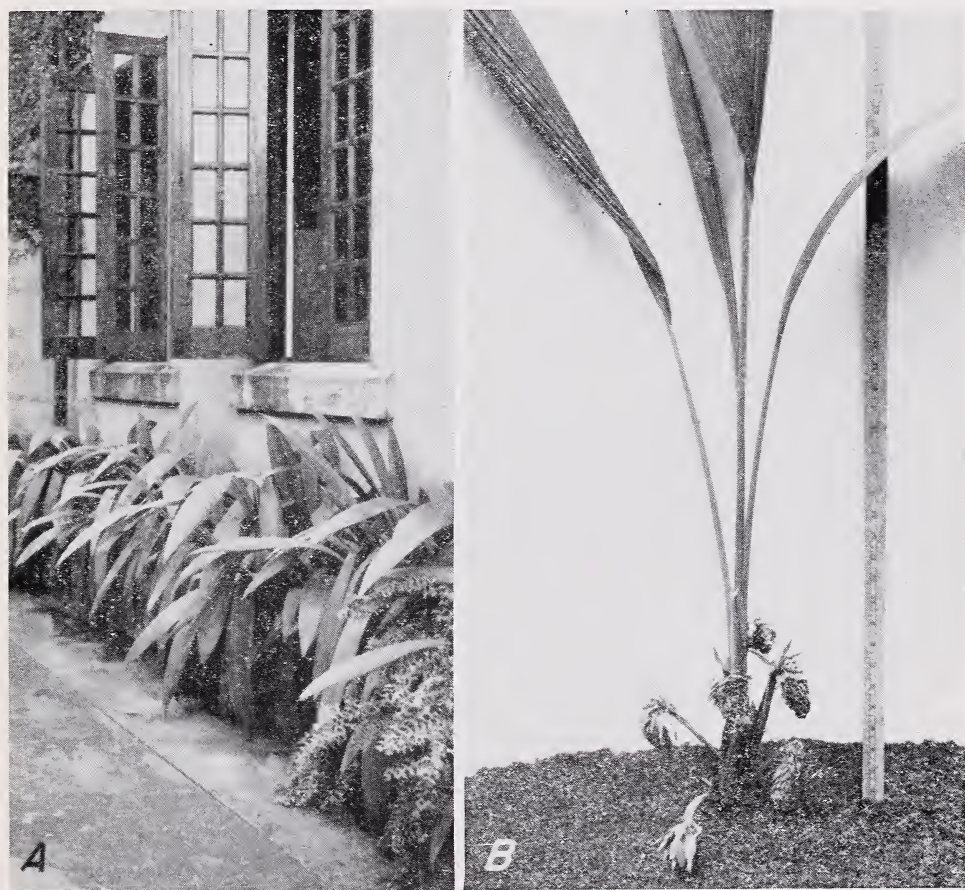


Figure 43.—*Molinieria hortensis* has been used in A as a foundation planting.
B, The star-shaped yellow flowers are borne in dense inflorescences which grow from the base of individual plants.

banana and will stand more cold. It is extensively grown in the West Indies for local consumption. Many country houses are ornamented by this banana planted in the dooryard.

It requires a rich, friable, moist soil and grows best in full sun. Propagation is by the sucker plants which develop at the base of established clumps.

Musa paradisiaca L. (fig. 44)
Musaceae

This genus includes the largest of the tree-like herbs grown for the ornamental effect of their striking foliage, for fiber, or for fruit. About 70 species and over 200 cultivated varieties are known native to tropical Asia, Africa, Australia, and the adjacent islands. Culture of these plants has spread to all tropical countries. Certain countries have specialized in the plants as plantation crops;



Figure 44.—*Musa paradisiaca* ssp. *sapientum*, the common banana, is a striking ornamental plant.

for instance, Manila hemp in the Philippine Islands and the edible banana in Central and South America.

Plants of *Musa paradisiaca* are universally cultivated in the Tropics, especially in the West Indies and Central America. This is the large-fruited plantain or cooking banana which is not suitable for eating raw. The whole plant reaches 20 to 30 feet in height often with several stems forming a clump. The leaves are oblong, thin, bright green, 5 to 8 feet long by $1\frac{1}{2}$ to 2 feet wide, with free petioles 1 to $1\frac{1}{2}$ feet long and sheathing below to form a fleshy false stem 20 to 25 feet tall. The 4- to 5-foot long inflorescence develops from the center of this stem. The inflorescence is nonbranched with large dark violet or reddish bracts shielding the numerous small elongated flowers. The fruit is cylindrical or somewhat angled, $\frac{1}{2}$ to 1 foot long, 40 to 80 in a bunch.

The common banana, which is the principal commercial type, belongs to *Musa paradisiaca* ssp. *sapientum* Kuntze. The plants differ from the types of banana plants previously described in only minor characters, but the fruit is smaller with a soft delicious flesh that is edible raw. Many varieties are grown in the Tropics for local consumption, and all of them are strikingly ornamental plants. Musas grow best in a rich, friable, moist soil in full sun or partial shade.

Propagation is by removal of the suckers which are found around the base of old plants. About 1 year is required for a sucker to grow into a large plant.

Musa sp. (fig. 45, A)

Musaceae

This dwarf species produces stems 3 to 6 feet in height and occasionally 3 inches in diameter at the base. Each stem is crowned with a number of oblong flat leaves 15 inches wide by 3 feet long which have a narrow red margin and red midrib on the lower surface. The erect inflorescence consists of bright rosy purple bracts about 6 inches long and $1\frac{1}{2}$ -inch yellow flowers striped with purple. The central stem of the inflorescence is also purple and pubescent. The angular inedible purple fruit are about 3 inches in length and covered with pubescence.

The cultural requirements of this species are the same as for *Musa paradisiaca*. Propagation is by suckers, which are freely produced, or by seed. Seedling plants come into flower in about 1 year.

Musa sumatrana Becc.

Sumatra Banana (fig. 45, B)

Musaceae

This plant is grown for the ornamental effect of its striking foliage. Its slender stems grow to 4 or 5 feet in height and produce several thin oblong bright green leaves which measure $1\frac{1}{2}$ feet wide and 5 to 6 feet long. The leaves and petioles are marked with large irregular blotches of claret brown. The flowers are much as in other species except for the pubescent rachis. Several seeds are borne in the dry cylindrical fruit, $\frac{1}{2}$ inch in diam-



Figure 45.—A, This *Musa* sp. produces yellow flowers, *a*, from bright rosy purple bracts and short pubescent purple fruit, *b*. B, *Musa sumatrana* has narrow green leaves that are blotched with claret brown.

eter by 2 to 3 inches long. This species is not so large as some other *Musas*. It can be combined with other foliage plants to give a striking tropical effect to the garden.

It requires a rich, moist soil and full sun or partial shade. Propagation is by suckers or by seed. Young plants produced by the latter method give highly colored foliage and are very ornamental.

***Pandanus baptisti* Hort.**

Screwpine (fig. 46)

Pandanaceae

The genus *Pandanus* belongs to the screwpine family which includes 3 genera and about 250 species native from Africa to Malaysia and the islands of the South Pacific. They are characterized by the spiral arrangement of the leaves on the branch tips and pineapple-like fruits which suggest the common name of the family. In the Tropics the *Pandanus* often attains tree size and the branching stems are frequently supported by prop roots. Some species are semiaquatic. The male and female flowers are borne separately on the same plant or on separate plants. The branched male inflorescence may be borne terminally or laterally on the branches, whereas the female is unbranched and always terminal on the branches. The compound fruit which is made up of angular woody or fleshy drupes may attain a length of 1 foot in some species.

Pandanuses are used for many purposes in the Tropics. The tough pliable leaves are used for thatching houses and are woven into mats for sleeping and floor covering, baskets, and other articles after removal of the spines from the midrib and margin.

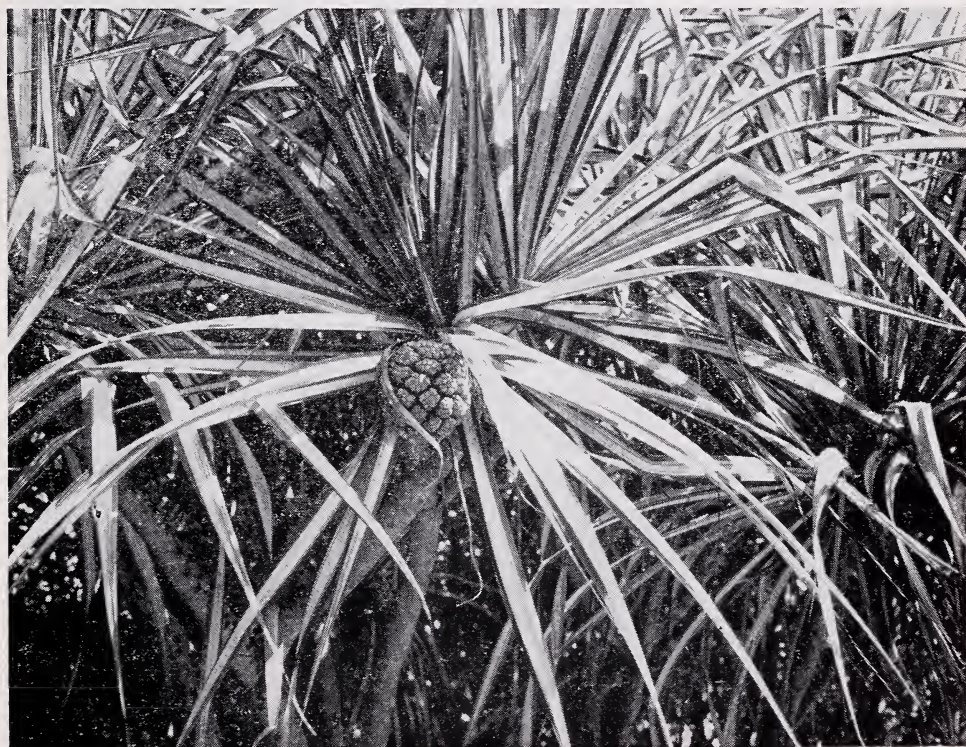


Figure 46.—Leaves of *Pandanus baptisti* bear a median band of yellow. The woody fruit segments turn orange red when ripe and drop to the ground.

In some species the fleshy inner end of the fragrant fruit segments is eaten as well as the nut-like seeds which are imbedded in the woody outer part of the fruit.

The definite botanical position of the plant grown in Puerto Rico as *Pandanus baptisti* is uncertain. The plants have grown rapidly to a height of 25 feet with branched stems and prop roots. Suckers are not produced along the main stems as in some other species. Each branch is terminated by a spiral crown of leaves which measure up to 3 inches wide and 7 feet long. The basal two-thirds of each leaf is stiff and channeled, and the upper one-third is more flat, flaccid, and tapers to a narrow point. The foliage is entirely without spines. Each leaf bears a broad central band of yellow or yellowish green. The pineapple-like fruit clusters are about 1 foot long with a number of orange-red drupelets that are fleshy at the base.

This plant is useful in large gardens where it may be grown as a specimen plant or planted in the background of shorter foliage plants. It requires a rich, moist soil in full sun or partial shade. Propagation is by seed or cuttings.

Pandanus pacificus Hort.
Pacific Screwpine
Pandanaceae

This species (cover illustration) grows to 40 feet in height and has large channeled leaves, up to 8 inches wide and 8 feet long, on mature plants which narrow abruptly to a 6-inch spiny triangular tip. The dark green leaves are armed with spines on the leaf margin and apically along the underside of the midrib. The basal half of the leaf may be unarmed along the midrib. This species grows into a dense mass with many sucker plants and thick prop roots at the base of the main trunk. It is useful for windbreaks near the sea, in the garden for screening undesirable views, or for planting along property boundaries.

The Pacific screwpine seems best adapted to areas of high rainfall but is not particular as to soil. It is propagated by suckers which may be removed and planted directly in the ground during the rainy season or rooted in sand beds during the dry season.

Pandanus utilis Bory
Common Screwpine (fig. 47, A)
"Palma de Tirabuzón"
Pandanaceae

This species is said to attain 60 feet in height in Madagascar where it is native. The plants have single branching stems and do not form large masses as in some other species. The blue-green or bronze leaves are about 2 inches wide by 3 feet long and have small red spines along the margin, although these are not usually found on the underside of the midrib. The leaves are used in the Tropics for weaving.

The plants grow best in rich soil, with plenty of moisture and sun. Propagation is by seed or cuttings.

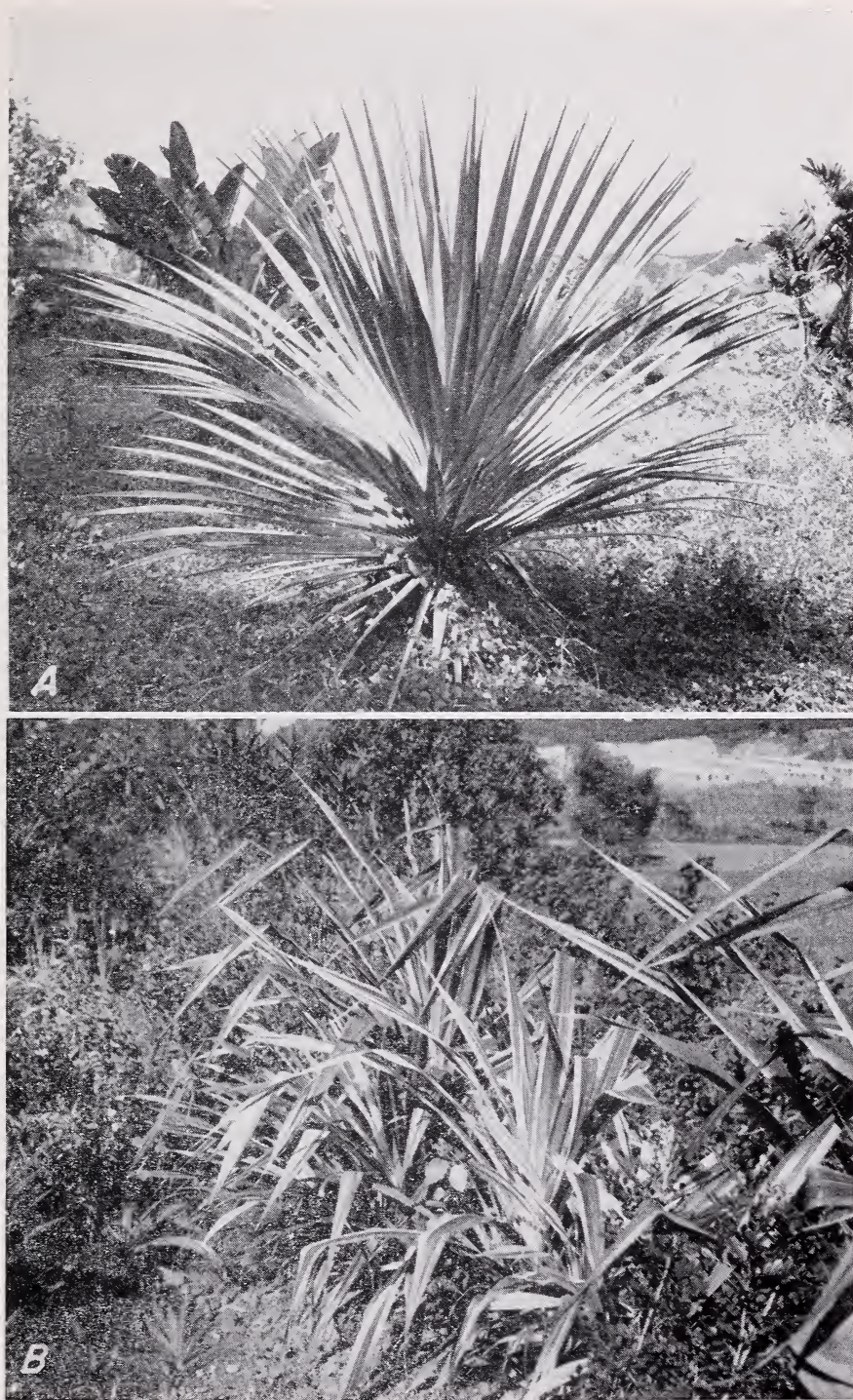


Figure 47.—A, This young plant of *Pandanus utilis* has the spiral character well developed. B, The most showy foliage of *P. veitchii* is produced in young plants.

Pandanus veitchii Dall.
Veitch Screwpine (fig. 47, B)
"Pandano"
Pandanaceae

This species grows to a height of 40 feet or more and produces a dense mass of leaves and aerial roots. In mature specimens the leaves measure up to 8 feet in length by 3 inches wide. They are armed along the margin and underside of the midrib with short dense spines. Leaves are dark green, banded along the margins with yellow or yellowish green, and become almost solid green with age. In this species the deeply channeled leaves are more pliable than in some of the other varieties and are useful in weaving.

Because of the beautiful foliage young plants are frequently grown in pots to decorate the house or patio. In the garden the veitch screwpine is often grown as a specimen plant or as a background for other foliage plants. It requires a rich, moist soil in full sun or partial shade.

Propagation is by seed, cuttings, or sucker plants which are produced freely on the base of the trunk.

Peperomia obtusifolia (L.) A. Dietr.
Ovalleaf Peperomia (fig. 48, A)
Piperaceae

This genus includes about 500 species which are found from Florida to Chile and Argentina with very few in other parts of the world. Only a few are cultivated as ornamental plants but there are others which are probably worthy of cultivation at least in countries where they occur naturally.

Peperomia obtusifolia is a branched spreading plant with upright branches. It bears dark green fleshy oval to obovate leaves $2\frac{1}{2}$ inches wide and about 4 inches in length, which are attached to the petioles at the margin. The slender erect flower spikes are borne terminally upon the branches; individual flowers are minute and not showy.

The ovalleaf peperomia is suitable for edging walks and borders of taller plants. It may be used as a ground cover for plants that lose their foliage during the dry season. The plants may also be grown in pots to decorate the house or patio. For this purpose a variety which has the leaves variegated with greenish yellow is more commonly grown. It requires a rich, moist soil and shaded location.

Propagation is by division of old plants but stem cuttings root easily and produce plants with better shape.

Peperomia sandersii var. *argyreia* Hort.
Sanders Peperomia (fig. 48, B)
Piperaceae

This almost stemless plant bears alternate ovate fleshy leaves 2 to $3\frac{1}{2}$ inches wide and 3 to 5 inches long. Broad white bands between the veins make a striped pattern somewhat resembling that



Figure 48.—A, *Peperomia obtusifolia* is a low-growing plant suitable for edging walks and borders or for use as a pot plant. B, *P. sandersii* var. *argyreia* is best grown as a pot plant.

of watermelon rind. The dark red 4- to 8-inch petioles are attached to the underside of the leaf well in from the margin. The plants are best suited for pot culture since they require shade and dampness for best development. They are good subjects for the garden or shade house where they may be grown with orchids and other foliage plants.

Propagation is by division of old plants or by leaf cuttings. When the latter method is used the leaf with part of the petiole attached is placed in a sand bed where shade and water can be carefully controlled until new roots and leaves have formed. The cuttings may then be removed and placed in individual pots.



Figure 49.—The showy flowers of *Phaeomeria speciosa* are bright red or flesh pink in color.

Phaeomeria speciosa (Blume) Koord.Synonyms: *Amomum magnificum* B. & H., *P. magnifica* Schum.

Torch Ginger, Wax Flower (fig. 49)

"Flor de Cera"

Zingiberaceae

The torch ginger is probably the most vigorous in growth of all the ornamental gingers. The arching stems often reach a height of 10 to 20 feet and bear large short petioled alternate leaves in two rows up the stem. Stems and leaves are bronze green in some varieties. The plants grow from underground root stocks and sometimes form large clusters of the reed-like stems.

The flowers are borne on separate stems which have no leaves and may stand 3 to 5 feet high. The flower head is made up of numerous red or pink bracts with white-lined edges. The basal bracts which are broad, waxy, and flowerless, become reflexed with age but the more narrow inner bracts build up into a cone-shaped head about 5 inches long. Protruding from beneath the inner bracts are small red or pink flowers with yellow margins. According to the variety the flower heads are either red or flesh pink. The red variety is more striking because of the brilliant color that extends into the stem and its clasping bracts.

Following the flowers an aggregate pink or red fruit is produced which somewhat resembles a small pineapple without its terminal tuft of leaves. The seed is small, black, and hard. These flower stems make excellent long-lasting cut flowers and when proper precautions are taken for packing may be shipped for long distances. The flowers are somewhat difficult to use in arrangements because of their size and heavy stems. Some flowers are produced throughout the year but the principal flowering occurs in the early part of the rainy season—April to July in Puerto Rico.

The torch ginger reaches its best development in rich moist or even wet soil. Semishaded locations seem to favor growth at low elevations but the plants will stand full sunshine at higher elevations in the Tropics. The plants are useful as property border plantings or for background plants in a mixed border with shrubs or other herbaceous plants.

Propagation is by division of the rhizomes which should be done when the plants start into growth after the dry season. The seed which is produced rather freely may also be used when large numbers of new plants are desired. The seedlings require 2 years to come into flower.

Philodendron sp. (fig. 50)

Araceae

This giant-leaved *Philodendron* from South America may be grown throughout the Tropics as an ornamental foliage plant. It belongs to the self-heading section of philodendrons which do not develop into climbing vines or will climb very slowly against a tree trunk or wall. The beautiful green leaves that measure up to 30 inches wide by 36 inches in length are somewhat 3-lobed, the segments again deeply lobed, and the margin undulated and somewhat irregular. The 30-inch petiole is marked with irregular



Figure 50.—*Philodendron* sp. bears large ornamental deeply cut leaves from slow-growing stems.

blotches and minute glandular dots of purple. It bears two parallel ridges from the base of the leaf to the short, thick stem which is clothed with membranous bracts that later dry into a fibrous mass. Although rarely produced in Puerto Rico the flowers are enclosed in a spathe which is yellow on the outside and white within.

Philodendron giganteum Schott described in Puerto Rico Circular No. 31 (11, pp. 43-44) is similar to this *Philodendron* sp. except that the large leaves are entire. In habit of growth the two species are identical.

Plants of *Philodendron* sp. are suitable for decorations in large rooms or porches. They may be grown in shaded corners of the patio without support or trained against a wall or treefern trunk. They should be planted in large pots with a well-drained moist soil. Heavy to medium shade should be given.

Plants are propagated by suckers which develop around the base of old plants or from sections of the stem which sometimes develops.

Ravenala madagascariensis J. F. Gmel.
Traveler's Palm, Traveler's-Tree (fig. 51)
"Arbol de Viajero," "Palma de Viajero"

Musaceae

This member of the banana family is widely grown in the Tropics as an ornamental plant. It resembles a giant fan with its

very large flattened cluster of long leaves at the tip of an unbranched woody trunk, 4 to 30 feet in height. The leaves, which measure $4\frac{1}{2}$ to 9 feet long, are exceeded in length by the thick petioles. It is from the sheathing bases of these petioles that the watery sap can be collected from which the plant gets its name. It is said that sufficient sap can be collected to afford a refreshing drink. The inflorescences which rise from the leaf axils consist of several large boat-shaped bracts alternating on opposite sides

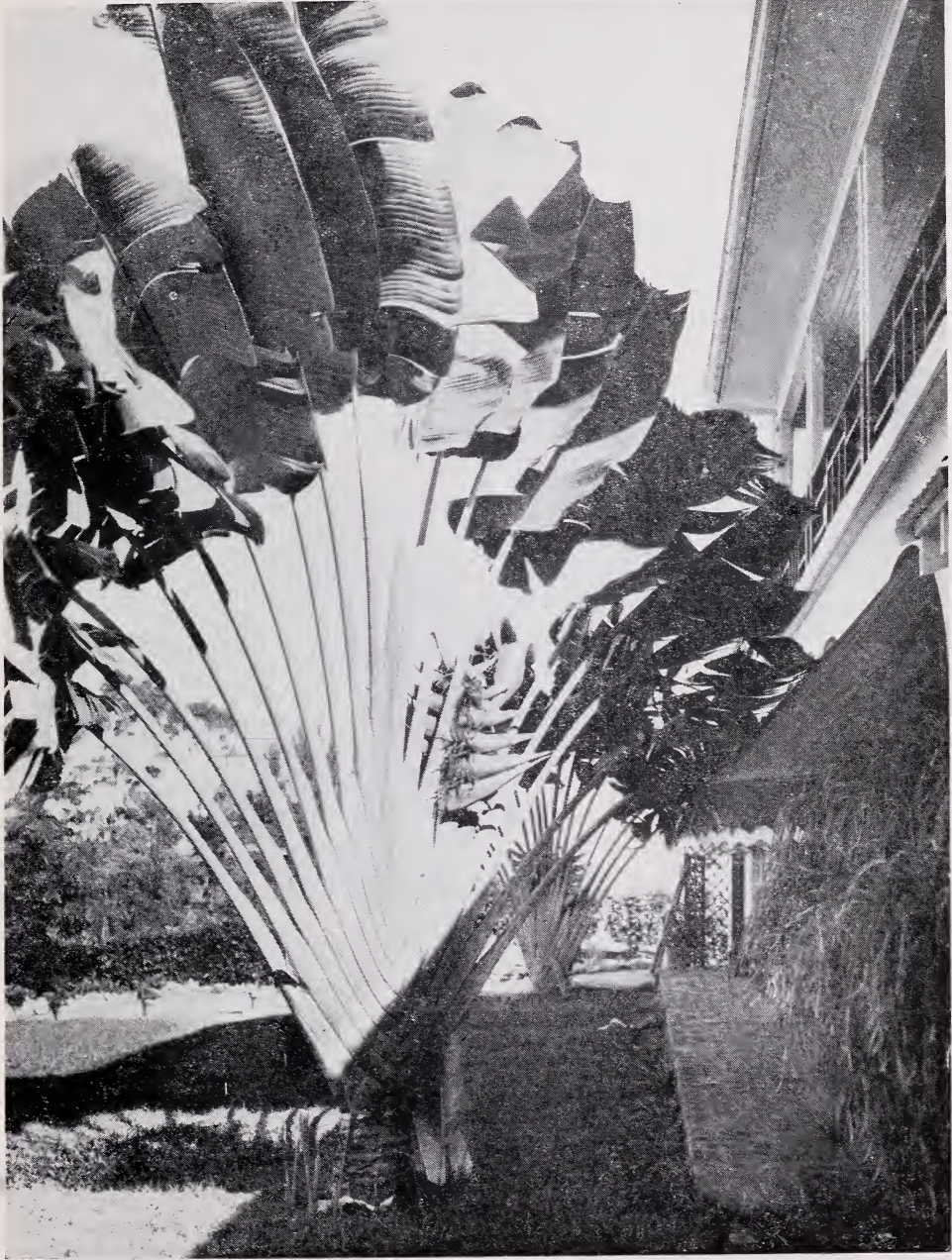


Figure 51.—The traveler's palm, *Ravenala madagascariensis*, produces a giant fan of leaves on long petioles.

of the rachis in one plane. Many white flowers that resemble those of *Strelitzia nicolai* are produced from each bract. Several rather large blue-coated seeds are produced in each capsule.

The wood of the trunk is said by Neal (20) to be used in Madagascar, home of the tree, for construction, the sap for producing sugar, the leaves for roofing, the blue seed coats for their anti-septic fat content, and the mealy seeds for food.

The traveler's palm grows well in a rich moist but well-drained soil in full sun. It is useful as a specimen plant in the open or may be placed behind lower growing plants. Because of its tropical effect the traveler's palm may be used effectively near large buildings or for planting along streets.

Propagation is usually by seed although suckers sometimes form at the base of young plants.



Figure 52.—The rosette plants of *Rhoeo discolor* produce succulent leaves which are green above and purple on the undersurface.

Rhoeo discolor (L'Her.) Hance
Synonym: *Tradescantia discolor* L'Her.
Oysterplant (fig. 52)
"Sangría," "Sanguinaria"
Commelinaceae

This low-growing herb is native to the West Indies and Florida and has been recorded from Mexico. It is a fleshy short-stemmed plant which produces a rosette of oblong lanceolate leaves 2 inches wide and up to 12 inches in length. The fleshy leaves are dark green on the upper surface and purple on the undersurface. Many small white flowers are borne inside unique inflorescences set on

short stalks in the axils of the lower leaves. The inflorescence is enclosed by two purplish compressed spathe-like bracts which open at the top as the flowers develop. The shape of this structure gave rise to the name "oysterplant."

In the West Indies the plants grow naturally on walls and in rocky woods at lower elevations. Extensive use has been made of them for garden border plants and they are sometimes cultivated as pot plants for the house or patio.

The plants grow best in a rich, moist but well-drained soil in full or partial shade. Propagation is by division or seed which is produced freely.

Sansevieria cylindrica Bojer
Ife Sansevieria (fig. 53, a)
"Sansiviera Redonda"
Liliaceae

About 60 species of *Sansevieria* are known from Africa and India, some of which are cultivated in tropical countries for the strong fiber contained in their leaves. A few species are cultivated extensively for the ornamental effect of their fleshy, erect, usually variegated leaves.

Sansevieria cylindrica bears solid cylindrical dark green banded leaves 1 to 4 feet long which terminate in a sharp point. Two to

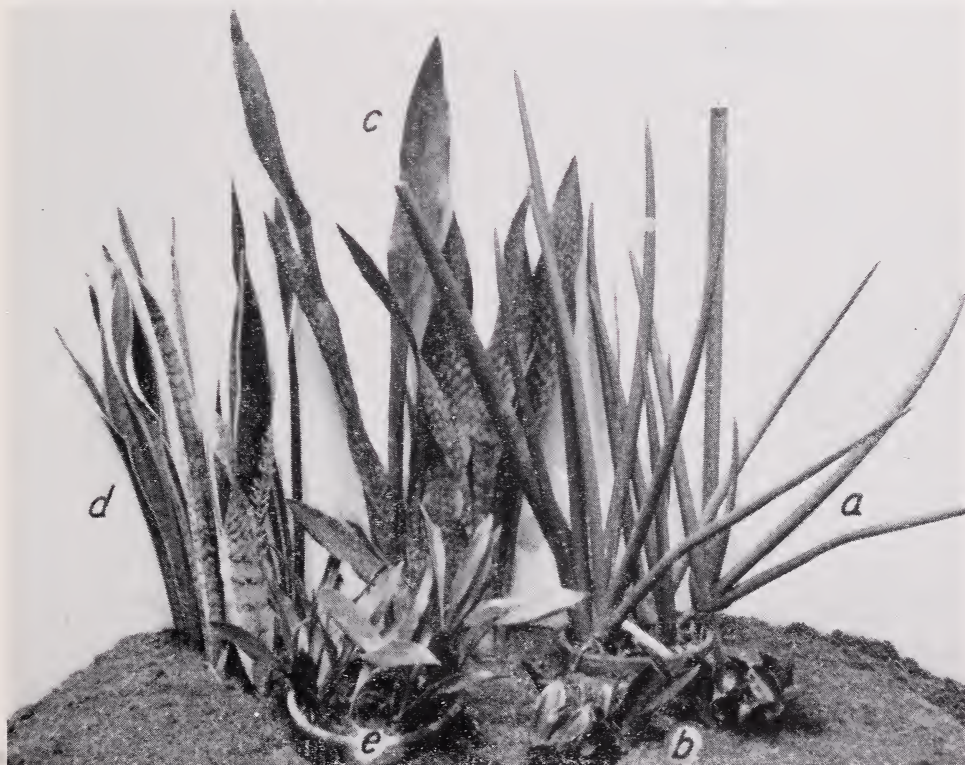


Figure 53.—a, *Sansevieria cylindrica* bears solid cylindrical banded leaves; b, *S. subspicata* is suitable for pot culture and for low edgings; c, *S. thyrsiflora* has become naturalized in Florida and the Greater Antilles; d, *S. trifasciata* var. *laurentii* is commonly grown as a pot plant; e, this *Sansevieria* sp. produces short foliage and tall flower spikes.

four leaves are clustered together on the short thick rhizomes. The flower stem develops from the center of these leafy growths and does not exceed them in length. It is thickly set for most of its length with small lily-like purplish-brown-stained flowers. Five or six flowers are borne in each cluster. This species of *Sansevieria* is usually grown in a large pot or jar in the patio or garden. It may be planted directly in the ground, in well-drained locations. In Puerto Rico it has grown best in partial shade with sandy or gravelly soil.

Propagation is by division of the old plants which become thickly matted after a few years.

Sansevieria sp.
Sansevieria (fig. 53, e)
Liliaceae

This low-growing species of *Sansevieria* has leaves up to 1 foot long and 1 to 1½ inches wide which taper at the base into a slender petiole. In color the leaves are dark green faintly marked with crossbands of a lighter green. Fragrant white flowers are borne on an unbranched stem which exceeds the leaves in height by about 1 foot.

This plant is suitable for pot culture or may be used as a low edging for the garden. It requires a heavy loam or clay. Propagation is by leaf cuttings or division.

Sansevieria subspicata Baker (fig. 53, b)
Liliaceae

This species grows to 1½ feet tall with leaves sometimes reaching 2 feet in length. However, under crowded pot conditions it seldom attains this size. More commonly the plants produce rosettes of ovate to lanceolate leaves 1 to 2½ inches wide and 3 to 7 inches long, which taper to a narrow point at the apex and are narrowed into a short petiole at the base. Leaves are dark green in color, obscurely banded or mottled with pale green. The undulate leaf margin is banded with red and sometimes with a white line of dried tissue on the edge.

The white flowers are borne in a simple inflorescence which does not exceed the leaves in height.

This plant is useful as a pot plant for the house or patio or may be used as an edging for garden walks or borders. It grows best in a heavy loam or clay soil in semishade. Propagation is by leaf cuttings or divisions.

Sansevieria thyrsiflora Thunb.
Synonym: *S. guineensis* Willd.
Sweet *Sansevieria* (fig. 53, c)
"Lengua de Chucho," "Lengua de Vaca," "Sansiviera"
Liliaceae

This species from tropical Africa was introduced during colonial times and is now spontaneous in wastelands and ravines from Florida through the Greater Antilles and Virgin Islands. Its erect

leaves are nearly flat but taper into narrow channelled petioles at the base. They arise from stout creeping rhizomes and are marked on both sides with pale green crossbands which become indistinct with age. The slightly undulated leaf margin is edged with a faint line of brownish red or white dried tissue. In the adult form the leaves may attain a height of $2\frac{1}{2}$ feet and a width of $3\frac{1}{2}$ inches. A juvenile rosette-type plant is often produced around the margin of old plantings and has narrow leaves up to about 8 inches in length. As these plants mature upright leaves develop. Leaf cuttings from the rosette plants will produce upright plants. Fragrant greenish flowers are clustered two or three together on the terminal half of the simple scape. The plants grow equally well in loamy or sandy coastal soils or on the heavy clays found in the hill section of Puerto Rico.

This species makes an excellent pot plant for the house or patio where it will stand considerable neglect. In the garden it may be used to border walks and drives, combined with other foliage plants in border plantings, or used as an informal hedge to divide properties for different uses.

Propagation is by division or leaf cuttings. Three-inch sections are sufficient to produce new plants and these may be rooted in either sand or soil. The basal end must be placed down when planting or the cutting will fail to root. Joyner et al (13) have shown that the midsections and tips produce better plants than the bases of the leaves. About 90 days are required for the new shoots to develop, after which they may be removed from the propagation bed and either potted or set in the garden.

Sansevieria trifasciata var. *laurentii* (De Willdem.) N. E. Br.
Bowstring Hemp, Congo Snake Sansevieria (fig. 53, d)
"Sansiviera"
Liliaceae

This attractive foliage plant is grown for the sword-shaped, pointed leaves, which are irregularly cross-banded and marbled with dark green and broadly margined with rich yellow. The plants are upright in habit and tend to form dense clumps. The leafy growths arise from underground or creeping rhizomes. The fleshy leaves grow from 1 to 4 feet tall and 1 to 3 inches in width. More than any other sansevieria this variety is grown as a pot plant for the house or patio. It is capable of withstanding a great deal of neglect and will survive long periods without water and with poor light conditions. This sansevieria will grow satisfactorily in any good soil but does best in a rather heavy loam.

Propagation is by division of the plants, as plants grown from leaf cuttings usually revert to the green form.

Strelitzia nicolai Regel & Koern.
Giant Bird-of-Paradise-Flower (fig. 54)
Musaceae

Four species of this South African genus are known which include some of the most colorful and exotic of tropical Musaceae (6). This species grows to a height of 18 feet and bears leaves



Figure 54.—A, *Strelitzia reginae* may grow to a height of 18 feet in good soil. The flowers, B, arise from the purple boat-shaped bracts of the inflorescence.

which greatly resemble its relative, the banana plant, in appearance. In the *Strelitzia*, however, the leaves are longer stalked and arise from only two sides of the laterally compressed stem much as in the traveler's palm.

The short-stalked inflorescences, which arise from the axils of the leaves, consist of three to four deep purple pointed alternate bracts which may reach 12 inches in length. From each arises a series of flowers which are said to resemble a tropical bird poised before taking flight. The white sepals of the flower measure about 5 inches in length by $\frac{3}{4}$ inch in width, and the blue inner segments combine to form a tongue-like structure which partially conceals the stamen and pistil.

Culture of the plants is not difficult. It requires sun or partial shade, water, and a fertile soil. New plants can be grown from seed or from the sprouts which arise around established plants.

Strelitzia reginae Banks
Queens Bird-of-Paradise-Flower (fig. 55)
Musaceae

The bird-of-paradise flower is the most colorful and most commonly planted of the genus. The almost stemless plants bear strong leaves about 1 foot long on radical stalks two to three times as long. The 3-foot flower stems are higher than the leaves and bear a single horizontal spathe about 6 inches long. On very short stalks, flowers with three bright orange sepals and three deep



Figure 55.—With its showy orange and blue flowers *Strelitzia reginae* is the most ornamental strelitzia in cultivation.

blue petals (one reduced) arise from the green and purple boat-shaped spathe. Only one or two flowers are open at a time but as they fade they are replaced by new ones from within the spathe. The flowers make excellent long-lasting cut flowers. The plants are equally beautiful as garden subjects or may be grown in large pots or tubs on the porch or patio.

This species requires a fertile, moist soil and plenty of sunlight for best development. It may be propagated by seed which develop after hand pollination but the plants usually require several years to bloom. Division of old clumps and suckers is used more frequently.

Tacca chantrieri André

Cat's Face, Chantrier Tacca, Devil Flower (fig. 56)

Taccaceae

This native of the oriental tropics is grown for the ornamental effect of its large leaves and for its curious flowers. It is a perennial herb with a short caudex and bright green leaves 8 to 10½ inches wide and up to 20 inches long. The leaves, which are unsymmetrical at the base and marked with numerous side veins, are borne on reddish-brown petioles. The inflorescence is borne on a purple stalk which exceeds the leaves in height. It consists of several brownish purple flowers about 2 inches long, which are



Figure 56.—*Tacca chantrieri* is grown for its ornamental green leaves and odd purplish inflorescences.

subtended by several purplish bracts and several long thread-like segments. As the fruit develops the flower stem is bent to the ground by the weight of the 2-inch purple capsules.

This species is best planted in a shaded moist part of the garden. It may be combined with other foliage plants or placed in the foreground of shrubbery. Propagation is by seed.

Xanthosoma caracu Koch & Bouché

Tanier (fig. 57, A)

"Yautía Horqueta," "Yautía Manola," "Yautía Viequera"

Araceae

About 37 species of this genus are known from South and Central America and from the West Indian Islands. All of them bear ornamental leaves and many yield edible corms as well. The botany of the *Xanthosoma* species is confused. They differ in size of plants and leaves and in coloration. In some species the leaves and petioles are tinted with violet. *Xanthosoma caracu* is widely cultivated in Puerto Rico and is often seen growing in dooryard gardens along with bananas. The leaves which measure up to 15 inches wide and 2 feet in length are borne on thick succulent petioles. Leaves are bright green above and pale green on the undersurface.

Clumps of tanier may be included with other foliage plants in the garden border. They grow best in a rich moist but not wet soil, in full sun, or in partial shade.

Propagation is by division of the corms. New plantings should be made at the beginning of the rainy season.

Xanthosoma jacquinii Schott

Giant Tanier (fig. 57, B)

"Yautia Palma," "Yautia Silvestre"

Araceae

This striking plant has become naturalized after cultivation in Puerto Rico, the Lesser Antilles, and South America. In Puerto Rico it is seen from near sea level to 3,000 feet elevation. The plants produce an upright or reclining stem which is often 3 to 8 feet in length and 6 inches thick. Although this stem contains an acrid juice it may be cooked for human food after slicing and drying in the sun. In Puerto Rico it is commonly fed to pigs. Under good growing conditions the petioles will attain a length of 6 feet with a basal diameter of 3 inches. The broadly cordate leaves measure 30 inches across and up to 40 inches in length. They are dark green above with the undersurface pale green and bear prominent midribs and side veins. The sinus formed between the two basal lobes is broad and open. Both leaves and petioles exude a milky sap when cut. The inflorescence, which somewhat resembles an elongated calla lily, is borne on a short stout stem from the center of the leaves. Its conspicuous part is the spathe, which is purple or green below expanding into a broad purple or yellow blade.

For landscape use the giant tanier may be planted as a background for showy foliage plants. It is also well suited to planting along streams and lagoons where it will form large clumps if let alone. The plants seem to grow well on either loam or clay soil and reach their best development in dense or partial shade.

Propagation is by suckers which develop around the base of old plants. The suckers may be encouraged by cutting off the growing point of an old plant.

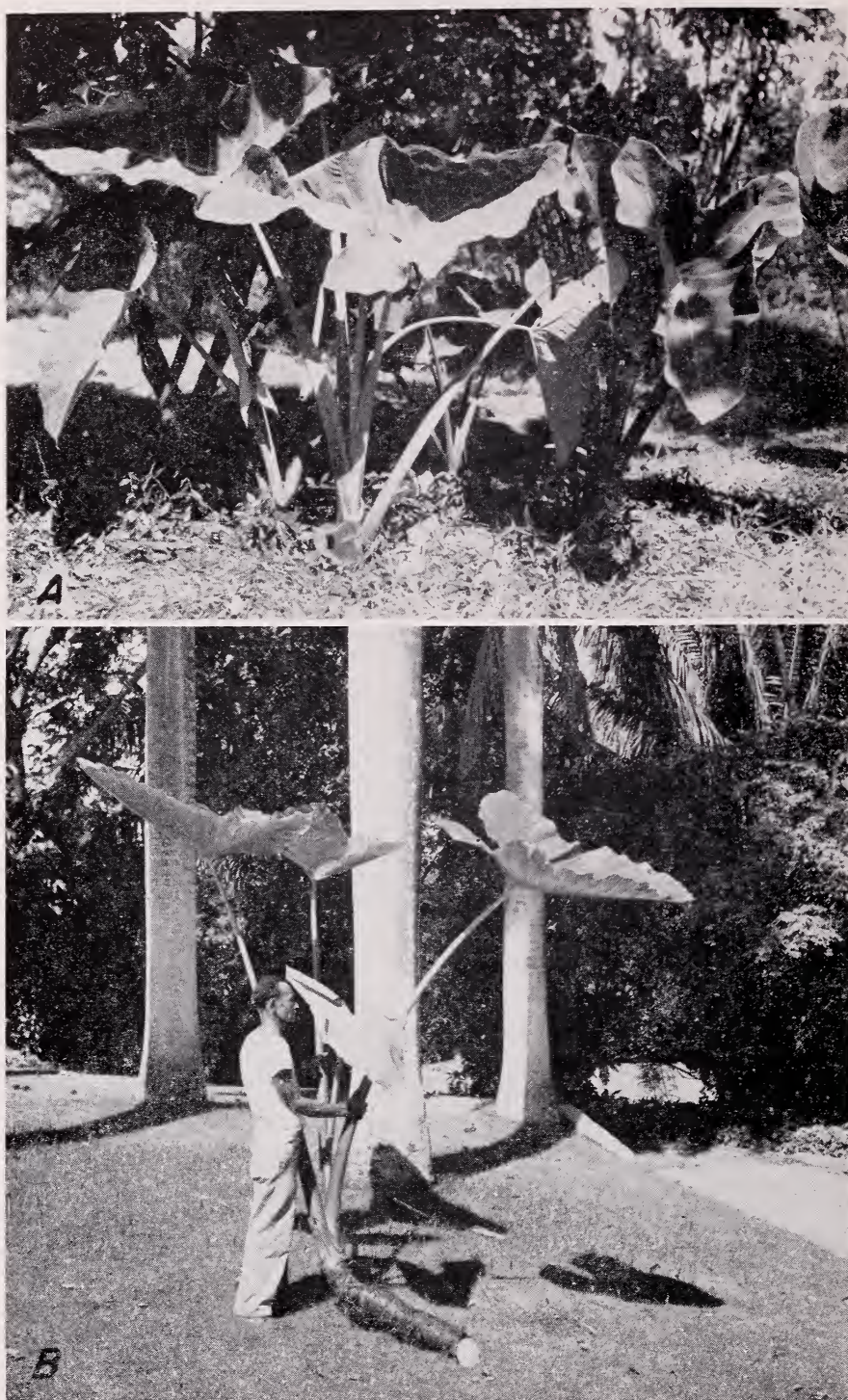


Figure 57.—A, Although cultivated principally as a food crop *Xanthosoma caracu* is equally valuable as an ornamental plant. B, *Xanthosoma jacquinii* bears large cordate leaves on long petioles.

Yucca aloifolia L.
 Spanish Bayonet, Aloe Yucca (fig. 58, A)
 "Bayoneta Española"
 Liliaceae

This native plant of the southeastern United States is more commonly grown in Puerto Rican gardens than the other species described here. It is a slow-growing plant commonly found throughout the drier West Indian islands to Trinidad. The erect stems are densely crowded with stiff lanceolate green leaves $1\frac{1}{2}$ inches wide and 18 to 24 inches in length. The leaf margin is rough and saw-like but does not develop threads as do some of the other species. Showy white or purple-tinged flowers nod in the branched terminal inflorescence. The fruit is a pulpy capsule about 3 inches long which does not split at maturity.

Yucca aloifolia is commonly planted in gardens and along roadsides in Puerto Rico where the people have the curious custom of sticking empty eggshells on the tips of the leaves. It combines well with other foliage plants in the garden or may be planted along boundaries. Best growth is obtained in full sun with a well-drained soil. Propagation is by seed, offsets, or stem cuttings.

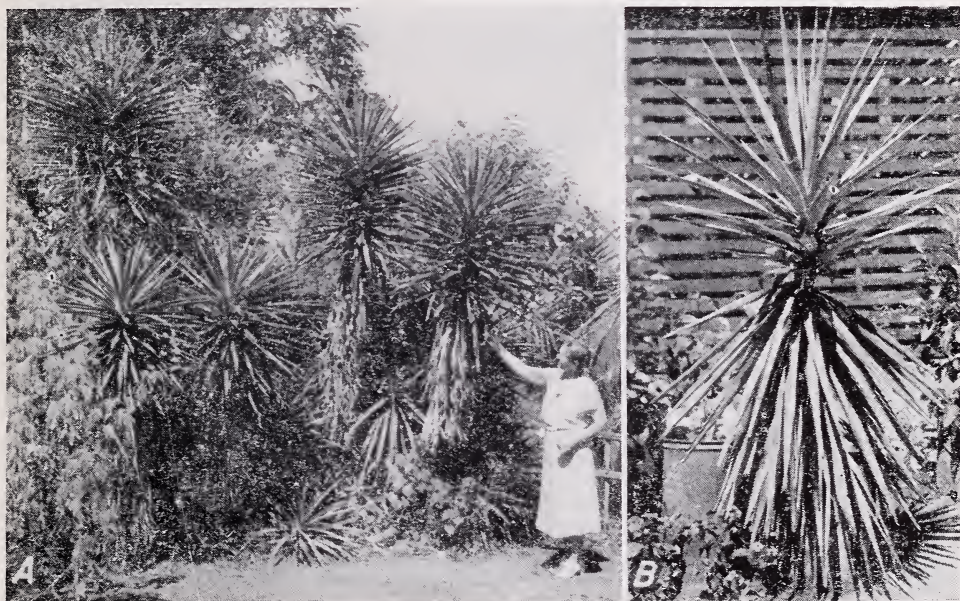


Figure 58.—A, The erect stems of *Yucca aloifolia* are densely foliated with stiff green leaves. B, *Y. elephantipes* may grow into tree size with a thick trunk and leaves.

Yucca elephantipes Regel
 Synonym: *Y. guatemalensis* Baker
 Bulbstem Yucca (fig. 58, B)
 Liliaceae

Yucca elephantipes from Central America may grow into a rather large tree with a thick trunk and stiff green leaves 2 to 3 inches wide. The flowers are borne in a terminal branched inflorescence and are followed by yellow fruit. This species is widely

planted in Guatemala to mark property boundaries. Large stakes are cut and set directly in the ground. Apparently all of them take root and grow to form a permanent boundary marker.

The plants will grow in either sun or shade and are not particular as to soil. Propagation is by seed or cuttings.

Yucca gloriosa L.
Spanish Bayonet, Moundlily Yucca
"Bayoneta Española"
Liliaceae

This native of the southeastern United States is occasionally planted in Puerto Rico and the Virgin Islands. Its tall stems are usually simple but may be branched. The stiff smooth leaves, 2 inches wide and up to 20 inches long, may bear a few teeth along the margin when young or a few threads when old. Showy white or red-tinged flowers are borne on a terminal branched flower stalk. Although not usually formed the fruit is a dry leathery capsule about $2\frac{1}{2}$ inches long which does not split open at maturity.

The plants are not particular as to soil so long as it is well drained. They are more tolerant of drought conditions than many of the other plants described in this publication and are better adapted to sunny locations. Propagation is by seed or cuttings.

Zantedeschia aethiopica Spreng.
Common Callalily
"Lirio Cala"
Araceae

This perennial herb is grown principally for its large showy lily-like flowers but the plants are also ornamental in foliage and make good garden or pot subjects. The common calla grows to 3 feet in height and bears smooth green arrow-shaped leaves up to 6 inches wide and 1 foot in length. The fragrant showy flowers are borne on thick stems which slightly exceed the leaves in height. The showy part is the funnel-shaped white spathe, creamy white on the inside, which encloses the bright yellow spadix. With age the spathe withers, exposing several fleshy green berries.

The common calla is an old favorite as a cut flower and is grown for this purpose in the tropical and temperate zones. In the Tropics the best growth and flowering is secured in the cool climate found at higher elevations where the plants make good garden subjects. In several parts of the Tropics the plants have escaped from cultivation and become naturalized in waste places such as along roadsides and ditches. The calla grows best in loamy or well-drained clay soil and responds to fertilization. The plants tolerate considerable moisture during the growth period and flowering but seem to need a dry season to rest the underground parts.

Propagation is by division of the clumps at the beginning of the rainy season or by seed.

INDEX TO PLANTS BY SCIENTIFIC AND COMMON ENGLISH AND SPANISH NAMES

	Page		Page
Agave — <i>Agave angustifolia</i>		Bayoneta española — <i>Yucca</i>	
var. <i>marginata</i>	9	aloifolia.....	85
<i>Agave americana</i>	8	Bayoneta española — <i>Yucca</i>	
<i>Agave angustifolia</i>		gloriosa.....	86
var. <i>marginata</i>	9	Boca de dragón — <i>Alpinia speciosa</i>	19
<i>Agave sisalana</i>	11	Botecitos — <i>Heliconia bihai</i>	57
<i>Aglaonema commutatum</i>	11	Bowstring hemp — <i>Sansevieria</i>	
<i>Aglaonema costatum</i>	12	trifasciata var. <i>laurentii</i>	79
<i>Aglaonema simplex</i>	13	<i>Bromelia pinguin</i>	28
<i>Alocasia indica</i> var. <i>metallica</i>	14	Bulbstem yucca — <i>Yucca</i>	
<i>Alocasia macrorrhiza</i>	14	elephantipes.....	85
<i>Alocasia plumbea</i> . See <i>Alocasia</i>		Butterfly lily — <i>Hedychium</i>	
indica var. <i>metallica</i>	14	coronarium.....	52
Aloe yucca — <i>Yucca aloifolia</i>	85	Caladio — <i>Caladium bicolor</i>	29
<i>Alpinia antillarum</i>	16	<i>Caladium bicolor</i>	29
<i>Alpinia nutans</i> . See		<i>Caladium hybrids</i>	29
<i>Alpinia speciosa</i>	19	<i>Calathea allouia</i>	32
<i>Alpinia purpurata</i>	17	<i>Calathea lietzei</i>	31
<i>Alpinia racemosa</i> . See		<i>Calathea oppenheimiana</i> . See	
<i>Alpinia antillarum</i>	16	<i>Ctenanthe oppenheimiana</i>	44
<i>Alpinia sanderæ</i>	19	<i>Calathea ornata</i>	32
<i>Alpinia speciosa</i>	19	<i>Calathea ornata</i> var. <i>roseolineata</i> .	
<i>Alpinia vittata</i> . See		See <i>Calathea ornata</i>	32
<i>Alpinia sanderæ</i>	19	<i>Calathea picturata</i> . See	
Amaranta — <i>Maranta</i>		<i>Calathea vandenheckei</i>	33
arundinacea var. <i>variegata</i>	60	<i>Calathea vandenheckei</i>	33
<i>Amomum magnificum</i> . See		<i>Calathea zebrina</i>	34
<i>Phaeomeria speciosa</i>	73	Cana — <i>Canna</i> spp.	36
<i>Amomum</i> sp.	21	Caña amarga — <i>Costus</i>	
<i>Anthurium</i> — <i>Anthurium</i>		cylindricus.....	40
andraeanum.....	24	Canereed spirallflag — <i>Costus</i>	
<i>Anthurium acaule</i>	22	speciosus.....	42
<i>Anthurium andraeanum</i>	24	<i>Canna coccinea</i>	35
<i>Anthurium longilaminatum</i>	25	<i>Canna edulis</i>	36
<i>Anthurium magnificum</i>	25	<i>Canna</i> spp.	36
<i>Anthurium scandens</i>	26	Carib heliconia — <i>Heliconia bihai</i>	57
<i>Anthurium scherzerianum</i>	25	Cat's face — <i>Tacca chantrieri</i>	82
<i>Anturium</i> — <i>Anthurium</i>		Centuryplant — <i>Agave americana</i>	8
andraeanum.....	24	Chantrier tacca — <i>Tacca</i>	
Arbol de viajero — <i>Ravenala</i>		chantrieri.....	82
madagascariensis.....	74	Chinese banana — <i>Musa nana</i>	63
Aspidistra — <i>Aspidistra lurida</i>	27	Chinese evergreen — <i>Aglaonema</i>	
<i>Aspidistra elatior</i> . See		simplex.....	13
<i>Aspidistra lurida</i>	27	Cocomacaco — <i>Dracaena fragrans</i>	49
<i>Aspidistra lurida</i>	27	<i>Colocasia esculentum</i>	37
Balisier — <i>Heliconia bihai</i>	57	<i>Colocasia</i> sp.	38
Banded galangal — <i>Alpinia</i>		Common callalily — <i>Zantedeschia</i>	
sanderæ.....	19	aethiopica.....	86
Bandera española — <i>Canna</i>		Common dracena — <i>Cordylina</i>	
coccinea.....	35	terminalis.....	39
Bayoneta — <i>Cordylina terminalis</i> ...	39		

INDEX TO PLANTS BY SCIENTIFIC AND COMMON
ENGLISH AND SPANISH NAMES—Continued

	Page		Page
Common screwpine — <i>Pandanus</i>		Garland flower — <i>Hedychium</i>	
<i>utilis</i>	68	<i>coronarium</i>	52
Congo snake sansevieria — <i>Sanse-</i>		Giant alocasia — <i>Alocasia</i>	
<i>vieria trifasciata</i> var. <i>laurentii</i>	79	<i>macrorrhiza</i>	14
<i>Cordyline terminalis</i>	39	Giant bird-of-paradise-flower —	
<i>Cordyline terminalis</i> var. <i>tricolor</i>	40	<i>Strelitzia nicolai</i>	79
<i>Costus cylindricus</i>	40	Giant tanager — <i>Xanthosoma</i>	
<i>Costus elegans</i> . See <i>Costus</i>		<i>jacquinii</i>	83
<i>malortieanus</i>	42	Gruya — <i>Canna edulis</i>	36
<i>Costus malortieanus</i>	42	Guapa — <i>Dracontium</i>	
<i>Costus speciosus</i>	42	<i>polyphyllum</i>	51
<i>Costus zebrinus</i> . See <i>Costus</i>		Guinda — <i>Anthurium scandens</i>	26
<i>malortieanus</i>	42	Guineo cimarrón — <i>Heliconia</i>	
Crepe ginger — <i>Costus speciosus</i>	42	<i>bihai</i>	57
<i>Ctenanthe oppenheimiana</i>	44	Guineo enano — <i>Musa nana</i>	63
<i>Cyperus alternifolius</i>	44	Guineo silvestre — <i>Heliconia</i>	
<i>Cyperus papyrus</i>	45	<i>bihai</i>	57
Dasheen — <i>Colocasia esculentum</i> ..	37	<i>Hedychium coronarium</i>	52
Devil flower — <i>Tacca chantrieri</i> ..	82	<i>Hedychium hybrid</i> (<i>H. flavum</i> ×	
<i>Dieffenbachia picta</i>	45	<i>H. gardnerianum</i>)	54
<i>Dieffenbachia picta</i> var. <i>bausei</i>	46	<i>Hedychium</i> sp.	54
<i>Dieffenbachia picta</i> var. <i>Rudolph</i>		Heliconia — <i>Heliconia latispatha</i> ..	59
<i>Roehrs</i>	46	<i>Heliconia bihai</i>	57
<i>Dieffenbachia seguine</i>	47	<i>Heliconia edwardus rex</i>	57
<i>Dieffenbachia weiri</i>	46	<i>Heliconia latispatha</i>	59
<i>Dracaena aurea</i>	49	Henequén — <i>Agave americana</i>	8
<i>Dracaena draco</i>	49	Hoja de costado — <i>Anthurium</i>	
<i>Dracaena fragrans</i>	49	<i>acaule</i>	22
<i>Dracaena fragrans</i> var. <i>lindenii</i> ..	49	Ife sansevieria — <i>Sansevieria</i>	
<i>Dracaena fragrans</i> var.		<i>cylindrica</i>	77
<i>massangeana</i>	49	Ilang-ilang de la tierra —	
<i>Dracaena godseffiana</i>	49	<i>Kaempferia rotunda</i>	59
<i>Dracaena sanderiana</i>	49	Jazmín cimarrón — <i>Hedychium</i>	
<i>Dracontium polyphyllum</i>	51	<i>coronarium</i>	52
Dragonaroid — <i>Dracontium</i>		Jazmín del río — <i>Hedychium</i>	
<i>polyphyllum</i>	51	<i>coronarium</i>	52
Drecina — <i>Dracaena fragrans</i>	49	Jengibre de jardín — <i>Alpinia</i>	
Duende violeta — <i>Kaempferia</i>		<i>sanderiae</i>	19
<i>rotunda</i>	59	<i>Kaempferia rotunda</i>	59
Dumb cane — <i>Dieffenbachia</i>		Lace-leaf — <i>Anthurium acaule</i>	22
<i>seguine</i>	47	<i>Languas speciosa</i> . See <i>Alpinia</i>	
Dwarf banana — <i>Musa nana</i>	63	<i>speciosa</i>	19
Edible canna — <i>Canna edulis</i>	36	Lengua de chucho — <i>Sansevieria</i>	
Elephant's ear — <i>Colocasia</i>		<i>thyrsiflora</i>	78
<i>esculentum</i>	37	Lengua de vaca — <i>Anthurium</i>	
Fancy leaf caladium — <i>Caladium</i>		<i>longilaminatum</i>	25
<i>bicolor</i>	29	Lengua de vaca — <i>Sansevieria</i>	
Female karata — <i>Furcraea</i>		<i>thyrsiflora</i>	78
<i>tuberosa</i>	52	Lietze calathea — <i>Calathea lietzei</i>	31
Flamingo flower — <i>Anthurium</i>		Lirio cala — <i>Zantedeschia</i>	
<i>andraeanum</i>	24	<i>aethiopica</i>	86
Flor de cera — <i>Phaeomeria</i>		Lobster's claw — <i>Heliconia bihai</i>	57
<i>speciosa</i>	73	Magüey — <i>Agave americana</i>	8
Flor de culebra — <i>Anthurium</i>		Magüey criollo — <i>Furcraea</i>	
<i>acaule</i>	22	<i>tuberosa</i>	52
Fragrant dracena — <i>Dracaena</i>		Malanga — <i>Colocasia esculentum</i>	37
<i>fragrans</i>	49	Malanga morada — <i>Alocasia</i>	
<i>Furcraea lindeni</i> . See <i>Furcraea</i>		<i>indica</i> var. <i>metallica</i>	14
<i>selloa</i> var. <i>marginata</i>	51	Malay ginger — <i>Costus speciosus</i>	42
<i>Furcraea selloa</i> var. <i>marginata</i>	51	Maraca — <i>Canna coccinea</i>	35
<i>Furcraea tuberosa</i>	52	Maraca — <i>Canna</i> spp.	36
Garden canna — <i>Canna</i> spp.	36		

INDEX TO PLANTS BY SCIENTIFIC AND COMMON ENGLISH AND SPANISH NAMES—Continued

	Page		Page
Maranta — <i>Maranta arundinacea</i>		Pimienta angola — <i>Alpinia</i>	
var. <i>variegata</i>	60	speciosa	19
<i>Maranta arundinacea</i>	60	Pinguin bromelia — <i>Bromelia</i>	
<i>Maranta arundinacea</i> var.		pinguin	28
variegata	60	Pita — <i>Agave americana</i>	8
<i>Maranta conspicua</i> . See		Pitisilén — <i>Maranta arundinacea</i>	
<i>Calathea lietzei</i>	31	var. <i>variegata</i>	60
<i>Maranta leuconeura</i> var.		Plátano de indio — <i>Heliconia</i>	
kerchoveana	62	bihai	57
<i>Maranea neubertii</i> . See		Queens bird-of-paradise-flower —	
<i>Calathea lietzei</i>	31	<i>Strelitzia reginae</i>	81
<i>Maranta ornata</i> . See <i>Calathea</i>		Rábano — <i>Dieffenbachia picta</i>	45
<i>ornata</i>	32	Rábano cimarrón —	
<i>Maranta vandenheckei</i> . See		<i>Dieffenbachia seguine</i>	47
<i>Calathea vandenheckei</i>	33	Rabo de rata — <i>Anthurium</i>	
<i>Maranta zebrina</i> . See <i>Calathea</i>		acaule	22
<i>zebrina</i>	34	<i>Ravenala madagascariensis</i>	74
Mariposa blanca — <i>Hedychium</i>		Red ginger — <i>Alpinia purpurata</i>	17
coronarium	52	Redspot arrowroot — <i>Maranta</i>	
Maya — <i>Bromelia pinguin</i>	28	leuconeura var. <i>kerchoveana</i>	62
Metallic Indo-Malayan alocasia —		Resurrectionlily — <i>Kaempferia</i>	
<i>Alocasia indica</i> var. <i>metallica</i>	14	rotunda	59
Moco de pavo — <i>Anthurium acaule</i>	22	<i>Rhoeo discolor</i>	76
<i>Molineria hortensis</i>	62	Roseline bigleaf calathea —	
Moundlily yucca — <i>Yucca gloriosa</i>	86	<i>Calathea ornata</i>	32
<i>Musa cavendishii</i> . See <i>Musa</i>		Sanders dracaena — <i>Dracaena</i>	
nana	63	sanderiana	49
<i>Musa nana</i>	63	Sanders peperomia — <i>Peperomia</i>	
<i>Musa paradisiaca</i>	64	sandersii var. <i>argyreia</i>	70
<i>Musa paradisiaca</i> ssp. <i>sapientum</i>	65	Sangría — <i>Rhoeo discolor</i>	76
<i>Musa</i> sp.	65	Sanguinaria — <i>Rhoeo discolor</i>	76
<i>Musa sumatrana</i>	65	Sansevieria — <i>Sansevieria</i> sp.	78
Narciso — <i>Hedychium</i>		<i>Sansevieria cylindrica</i>	77
coronarium	52	<i>Sansevieria guineensis</i> . See	
Nardo — <i>Hedychium coronarium</i> ..	52	<i>Sansevieria thyrsiflora</i>	78
Ovalleaf peperomia — <i>Peperomia</i>		<i>Sansevieria</i> sp.	78
obtusifolia	70	<i>Sansevieria subspicata</i>	78
Oysterplant — <i>Rhoeo discolor</i>	76	<i>Sansevieria thyrsiflora</i>	78
Pacific screwpine — <i>Pandanus</i>		<i>Sansevieria trifasciata</i> var.	
pacificus	68	laurentii	79
Paleta de pintor — <i>Caladium</i>		Sansiviera — <i>Sansevieria</i>	
bicolor	29	thyrsiflora	78
Palma de tirabuzón — <i>Pandanus</i>		Sansiviera — <i>Sansevieria</i>	
utilis	68	trifasciata var. <i>laurentii</i>	79
Palma de viajero — <i>Ravenala</i>		Sansiviera redonda —	
madagascariensis	74	<i>Sansevieria cylindrica</i>	77
Pámpano — <i>Heliconia bihai</i>	57	Scarlet canna — <i>Canna coccinea</i> ..	35
Panamá — <i>Alocasia macrorrhiza</i> ..	14	Screwpine — <i>Pandanus baptisti</i>	67
Pandano — <i>Pandanus veitchii</i>	70	Seguin tuftroot — <i>Dieffenbachia</i>	
<i>Pandanus baptisti</i>	67	seguine	47
<i>Pandanus pacificus</i>	68	Shellflower — <i>Alpinia speciosa</i>	19
<i>Pandanus utilis</i>	68	Shellflower galangal — <i>Alpinia</i>	
<i>Pandanus veitchii</i>	70	speciosa	19
Paragüita — <i>Cyperus</i>		Shell ginger — <i>Alpinia</i>	
alternifolius	44	speciosa	19
<i>Peperomia obtusifolia</i>	70	Sisal — <i>Agave sisalana</i>	11
<i>Peperomia sandersii</i> var. <i>argyreia</i>	70	Sisal agave — <i>Agave sisalana</i>	11
<i>Phaemeria magnifica</i> . See		Sisal hemp — <i>Agave sisalana</i>	11
<i>Phaemeria speciosa</i>	73	Spanish bayonet — <i>Yucca</i>	
<i>Phaemeria speciosa</i>	73	aloifolia	85
<i>Philodendron</i> sp.	73	Spanish bayonet — <i>Yucca</i>	
<i>Philodendron giganteum</i>	74	gloriosa	86

INDEX TO PLANTS BY SCIENTIFIC AND COMMON
ENGLISH AND SPANISH NAMES—Continued

	Page		Page
Spiralflag — <i>Costus cylindricus</i>	40	Variegated Bermuda arrowroot—	
<i>Strelitzia nicolai</i>	79	<i>Maranta arundinacea</i> var.	
<i>Strelitzia reginae</i>	81	<i>variegata</i>	60
Stripeleaf furcrea — <i>Furcraea</i>		Veitch screwpine — <i>Pandanus</i>	
<i>selloa</i> var. <i>marginata</i>	51	<i>veitchii</i>	70
Sumatra banana — <i>Musa</i>		Wax flower — <i>Phaeomeria</i>	
<i>sumatrana</i>	65	<i>speciosa</i>	73
Sweet sansevieria — <i>Sansevieria</i>		White gingerlily — <i>Hedychium</i>	
<i>thyrsiflora</i>	78	<i>coronarium</i>	52
<i>Tacca chantrieri</i>	82	Wild plantain — <i>Heliconia bihai</i> ..	57
Tanier — <i>Xanthosoma caracu</i>	83	<i>Xanthosoma caracu</i>	83
Ti — <i>Cordyline terminalis</i>	39	<i>Xanthosoma jacquinii</i>	83
Torch ginger — <i>Phaeomeria</i>		Yautía horqueta — <i>Xanthosoma</i>	
<i>speciosa</i>	73	<i>caracu</i>	83
<i>Tradescantia discolor</i> . See		Yautía manola — <i>Xanthosoma</i>	
<i>Rhoeo discolor</i>	76	<i>caracu</i>	83
Traveler's palm — <i>Ravenala</i>		Yautía palma — <i>Xanthosoma</i>	
<i>madagascariensis</i>	74	<i>jacquinii</i>	83
Travelers-tree — <i>Ravenala</i>		Yautía silvestre — <i>Xanthosoma</i>	
<i>madagascariensis</i>	74	<i>jacquinii</i>	83
Umbrella flatsedge — <i>Cyperus</i>		Yautía Viequera — <i>Xanthosoma</i>	
<i>alternifolius</i>	44	<i>caracu</i>	83
Umbrella palm — <i>Cyperus</i>		<i>Yucca aloifolia</i>	85
<i>alternifolius</i>	44	<i>Yucca elephantipes</i>	85
Umbrella plant — <i>Cyperus</i>		<i>Yucca gloriosa</i>	86
<i>alternifolius</i>	44	<i>Yucca guatemalensis</i> . See <i>Yucca</i>	
Vandenheck calathea — <i>Calathea</i>		<i>elephantipes</i>	85
<i>vandenheckei</i>	33	Yuquilla — <i>Maranta arundinacea</i>	
Variable tuftroot — <i>Dieffenbachia</i>		var. <i>variegata</i>	60
<i>picta</i>	45	<i>Zantedeschia aethiopica</i>	86
		Zebra plant — <i>Calathea zebrina</i> ...	34
		Zebrina — <i>Calathea ornata</i>	32

LITERATURE CITED

- (1) ANONYMOUS.
1951. SUNSET IDEAS FOR BUILDING PLANT SHELTERS AND GARDEN WORK CENTERS. 78 pp., illus. Menlo Park, Calif.
- (2) BAILEY, L. H.
1935. THE STANDARD CYCLOPEDIA OF HORTICULTURE. Ed. 2, 3 v., illus. New York.
- (3) ———, and BAILEY, ETHEL Z.
1941. HORTUS SECOND. 778 pp., illus. New York.
- (4) BRITTON, N. L., and WILSON, P.
1924-30. BOTANY OF PORTO RICO AND THE VIRGIN ISLANDS. SCIENTIFIC SURVEY OF PORTO RICO AND THE VIRGIN ISLANDS. New York Acad. Sci. 4-5.
- (5) CHILDERS, N. F., WINTERS, H. F., SEGUINOT-ROBLES, P., and PLANK, H. K.
1950. VEGETABLE GARDENING IN THE TROPICS. Puerto Rico (Mayaguez) Fed. Expt. Sta. Cir. 32, 144 pp., illus.
- (6) CLARK, A. M.
1949. THE GIANT STRELITZIAS. Calif. Gard. 40 (2): 3-4, illus.
- (7) COOMBS, SARAH V.
1936. SOUTH AFRICAN PLANTS FOR AMERICAN GARDENS. 364 pp., illus. New York.
- (8) FAIRCHILD, D.
1941. EXPEDITION TO THE PHILIPPINES AND NETHERLANDS INDIA. Occasional Paper No. 9, Fairchild Tropical Garden, Coconut Grove, Fla. (February 1, 1941.)
- (9) FIRMINGER, T. A.
1947. MANUAL OF GARDENING FOR INDIA. Ed. 8 (Reprint), 666 pp., illus. Calcutta.
- (10) HOTTES, A. C.
1931. PRACTICAL PLANT PROPAGATION. Ed. 2, 224 pp., illus. New York.
- (11) HUME, E. P.
1949. SOME ORNAMENTAL VINES FOR THE TROPICS. Puerto Rico (Mayaguez) Fed. Expt. Sta. Cir. 31, 71 pp., illus.
- (12) ———
1951. SOME ORNAMENTAL SHRUBS FOR THE TROPICS. Puerto Rico (Mayaguez) Fed. Expt. Sta. Cir. 34, 151 pp., illus.
- (13) JOYNER, J. F., GANGSTAD, E. O., and SEALE, C. C.
1951. THE VEGETATIVE PROPAGATION OF SANSEVIERIA. Agron. Jour. 43: 128-130, illus.
- (14) KAINS, H. G., and MCQUESTEN, L. M.
1943. PROPAGATION OF PLANTS. Rev. and enl. ed., 555 pp., illus. New York.
- (15) KELSEY, H. P., and DAYTON, W. A.
1942. STANDARDIZED PLANT NAMES. Ed. 2, 675 pp. Harrisburg, Pa.
- (16) KUCK, L. E., and TONGG, R. C.
1936. THE TROPICAL GARDEN. 378 pp., illus. New York.
- (17) MACCARIO, G.
1950. HEDYCHUM CORONARIUM. Ital. Agr. 87: 113-115, illus.
- (18) MACMILLAN, H. F.
1935. TROPICAL PLANTING AND GARDENING. Ed. 4, 560 pp., illus. London.

- (19) MORRISON, B. Y.
1951. CONCERNING CALADIUMS. *Natl. Hort. Mag.* 30: 171-188.
- (20) NEAL, M. C.
1948. IN GARDENS OF HAWAII. Bernice P. Bishop Mus. Spec. Pub. 40, 805 pp., illus.
- (21) NEHRLING, H.
1933. THE PLANT WORLD IN FLORIDA. 304 pp. New York.
- (22) ———
1944. MY GARDEN IN FLORIDA. v. 1, 422 pp. Estero, Fla.
- (23) NEILSON, W. A., KNOTT, T. A., and CARHART, P. W., eds.
1946. WEBSTER'S NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE. Ed. 2, unabridged, 3350 pp., illus. Springfield 2, Mass.
- (24) NICHOLSON, G., ed.
[n. d.] THE ILLUSTRATED DICTIONARY OF GARDENING. 4 v., illus. London.
- (25) OTERO, J. I., TORO, R. A., and PAGÁN-OTERO, L.
1946. CATÁLOGO DE LOS NOMBRES VULGARES Y CIENTÍFICOS DE ALGUNAS PLANTAS PUERTORRIQUEÑAS. Puerto Rico Insular Expt. Sta. Bul. 37, 281 pp. (Ed. 2)
- (26) POPE, W. T.
1934. PROPAGATION OF PLANTS BY CUTTINGS IN HAWAII. Hawaii Agr. Expt. Sta. Cir. 9, 35 pp., illus.
- (27) POST, K.
1941. STRUCTURES FOR STARTING AND GROWING ORNAMENTAL PLANTS. Cornell Ext. Bul. 468, 22 pp., illus. (Reprinted 1945)
- (28) SIMPSON, C. T.
1926. ORNAMENTAL GARDENING IN FLORIDA. 243 pp., illus. Little River, Fla.
- (29) STRINGER, MARIE
1950. ASPIDISTRAS MAKE SOUTHERN COMEBACK. *Southern Seedsman* 13(8): 40, illus.
- (30) TAYLOR, NORMAN, ed.
1936. THE GARDEN DICTIONARY. 888 pp., illus. Boston and New York.
- (31) WATKINS, J. V.
1940. PROPAGATION OF ORNAMENTAL PLANTS. Fla. Agr. Expt. Sta. Bul. 347, 54 pp., illus.
- (32) WESTER, P. J.
1920. PLANT PROPAGATION IN THE TROPICS. Philippine Dept. Agr. and Natl. Resources Bur. Agr. Bul. 32, 134 pp., illus. (Revised)
- (33) WILLIAMS, R. O., and WILLIAMS, R. O., JR.
1941. THE USEFUL AND ORNAMENTAL PLANTS OF TRINIDAD AND TOBAGO. Ed. 3, 265 pp. Trinidad and Tobago: Govt.
- (34) WOODROW, G. M.
1910. GARDENING IN THE TROPICS. 634 pp., illus. Paisely, England.



